American Aviation

The Air Industry's Pioneer Independent Magazine

FEB. 1, 1950

One Exit

by W. W. P.

FROM HERE on for quite a spell you will be hearing and reading a lot about air mail pay subsidies, and airline route patterns.

The big drive is on in Washington to do something about those alleged mail pay "subsidies", to eliminate excessive competition in some sectors of the country and otherwise re-orient the airline system in order to divide it as closely as possible into a self-sufficient group and a subsidized group.

At times this big push is likely to be confusing but the major issues aren't as complicated as they may seem to be.

In the formal gardens of Hampton Court on the outskirts of London is a world-famous maze which for a long time has been a favorite of tourists. It is a large "puzzle" made of boxwood corridors. You go in one entrance and have to find your way out by trial and error, going up blind alleys, retracing, and finally making your way out through the only exit. There is but one entrance and but one exit but there are seemingly endless corridors and turns to throw the visitor off the correct route. Amusement parks and carnivals have similar baffling attractions usually called the House of Mirrors.

The present struggle to "do something" about the air transport system and reduce the over-all cost of carrying the mail reminds us of the Hampton Court maze. No matter how many corridors are explored, there is really just one exit and that exit in this case is the simple fact that it costs money to provide air service to small communities. Stated another way the basic problem is not one of subsidy but of route pattern. All paths eventually lead there.

For almost a year, now, the Senate Interstate and Foreign Commerce Committee headed by Senator Ed Johnson of Colorado has been studying the economics of the airlines. Not only has Senator Johnson been concerned about the allegations of high air mail subsidies but he is determined to prosecute a full study leading to the separation of the true costs of carrying the mail from subsidy. His first report is now due.

While we have felt that such a study was neither as urgent as the Senate committee indicated nor as easy of solution as the experts apparently believed, such a separation study should be beneficial in the long run. Let's investigate air mail costs thoroughly

(*Turn to Page 6*)

RECEIVED 31 JAN 1950 ARMY LIBRARY MATERIAL RECORD

Enters 25th Aviation Year

Clarence E. Fleming, vice president-regulatory proceedings for Trans World Airline, has begun his 25th year in the aviation industry. The TWA executive has specialized in mail and traffic matters during the past two and a half decades since starting his aviation career with National Air Transport in 1926. He joined TWA as mail traffic manager at Kansas City in 1934. He has been located in Washington since 1938 and was elected to his present position in 1942.

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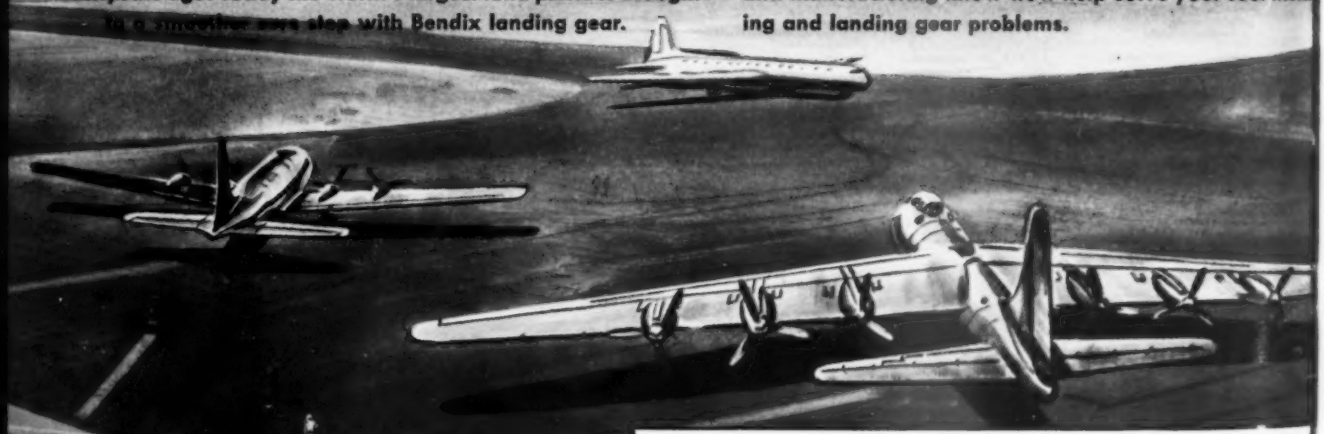

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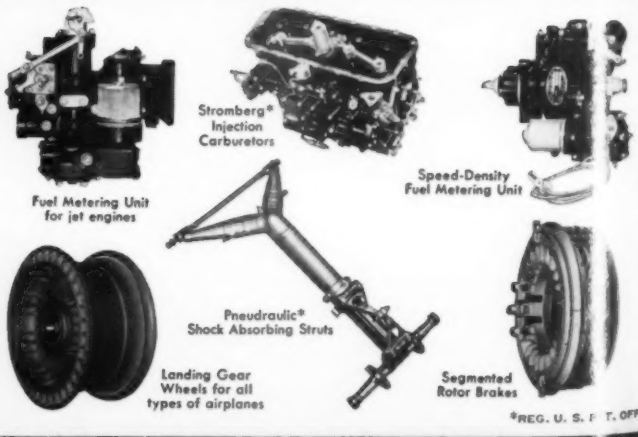
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BACKGROUND & TRENDS

Prototype Progress

Two bills covering government **aid in prototype aircraft construction** are close to introduction in Congress. One is the Defense Department's proposal for authority to contract for construction of prototypes with separate funds allocated to the Air Force for the purpose. The other is an Air Coordinating Committee bill providing for the government to underwrite costs of a testing program for prototypes. The bills are being submitted to Budget Bureau for approval before introduction. How they'll be handled in Cogress remains to be seen, but some observers believe the bills may eventually be combined.

Airline Experience on B-45's?

Under active consideration is a **plan involving the flying of North American B-45** four-jet bombers between military bases by airline and government personnel, under Military Air Transport Service auspices. Air Force is reported willing to allow use of the planes for this purpose. Airlines would get valuable jet experience, while government observers would gather data to help solve traffic control, operational and regulatory problems. The plan may be tied in with prototype legislation.

NAA or NAC?

The question of **which organization is going to be the national spokesman** and representative for all of U. S. aviation is more confused than ever. The National Aeronautic Association, which has been in that spot for some time, is still nominally the top single organization. But the National Air Council, originally organized in 1945 as The Air Power League, has now come forth with a broad program for the advancement of U. S. aviation paralleling in most respects the NAA program. Neither organization has much money. Irony is that NAC worked up its program without ever consulting Louis Leverone, NAA president, who is also on the executive committee of NAC. Plans to make NAC a counterpart to the Navy League as a tub-thumper for air power were abandoned in December when Secretary of Defense Louis Johnson frowned on the idea. NAC, incidentally, plans to sponsor a year-round celebration of aviation's golden anniversary in 1953.

Bucking the Trend

Although 1949's total inter-city and interstate traffic was down, the **airlines showed an increase.** The total traffic was off 12%, according to the U. S. Chamber of Commerce. All airlines (domestic trunk, feeder and international) showed a 13% increase in gross revenues in 1949 over 1948 (with operating expenses up 9%) and an 11.4% rise in revenue passenger-miles. Railroad passenger revenue was down 15%, while passenger-miles of inter-city buses slipped 10%.

A Long Look

With Congressmen introducing numerous bills and communities submitting many bids, the **Air Force is taking it slow** on selecting a site for the U. S. Air Force Academy. Survey teams will probably inspect as many as 150 sites.

Keeping an Eye on MATS

Several airlines are **following a wait-and-see course** on Military Air Transport Service's resumption of operations (six trips a month) to South America, despite Defense Department's assurance that service will not be competitive and that only military personnel and cargo will be carried. Air Transport Association is watching the entire pattern of MATS service around the world to learn the extent of diversion of military traffic from available scheduled airline service.

Action on Colonial

Action can be expected soon in the court dispute between Colonial Airlines and Trans-Canada Air Lines **over Montreal-New York route.** U. S. Supreme Court will review the lower court decision upholding constitutionality of last summer's U. S.-Canadian air agreement which would allow TCA to operate competitive service on the route. Oral argument will be held Feb. 17, and because the entire executive agreement procedure is involved, a quick decision is expected. Until it's settled, U. S. won't designate U. S. carriers for direct New York-Toronto route or Great Falls-Edmonton service, and Canadian Air Transport Board won't act on its threat to suspend Colonial's Montreal-New York license.

A Hot Potato

Chinese airline situation is a hot potato for the State Department to handle. Maj. Gen. Claire Chennault and Whiting Willauer have been trying to obtain possession in Hong Kong of China National Aviation Corp. and Central Air Transport Corp. planes they bought their company, CAT Inc., a U. S. corporation. British refuse to turn the planes over pending outcome of court action, which might possibly result in the equipment going to the Communists. State Department says the whole matter is highly confidential, but it's a good bet that it will back Chennault.

Among the Airlines

Hottest topic begin discussed in Washington these days is **proposed sale of American Overseas to Pan American.** Sharp exceptions taken by Public Counsel and Department of Justice to Examiner Thomas Wrenn's favorable recommendation (plus PAA's remark that Public Counsel accepted "hospitality" during the hearing from an opponent of the purchase) are causing much comment . . . Also being talked about is the **squabble over Holy Year Traffic** to Rome, and the lower and lower rates being announced by various airlines . . . It's a much surer bet that the 15% transportation tax will be **reduced instead of abolished** at this session of Congress. There's considerable sentiment for complete repeal, but the trouble is that there's no way of replacing government revenue that would be lost . . . **Florida season is off to a slow start,** as was the case last year. Main reason is warm weather in northeast. Airline loads to Florida relatively light . . . Capital Airlines went over its 1949 goal of $20 million in non-mail revenue by almost $3 million, has set **$30 million as 1950 mark.** Company says it had one of industry's largest percentage increases in non-mail revenue last year.

Global Transport - the Stratocruiser!

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News in Brief

Legislation to separate subsidy payments from air mail compensation was recommended by President Truman in his budget message to Congress. He said that the subsidies should be paid from funds appropriated to the CAB specifically for that purpose. Meanwhile, the Washington law firm of Sullivan, Bernard and Shay has been appointed to represent smaller airlines in the subsidy separation matter. Members of the firm are John L. Sullivan, former secretary of the Navy, Lawrence J. Bernard, former assistant general counsel of the Treasury Department, and John E. Shay, formerly connected with the same department. Airlines involved in the program were not named.

Douglas Aircraft Co. is now **running flight tests for certification** of the Super DC-3 and the DC-6A. Certification was held up by the company to allow a shake-down flight program. A new tail has been installed on the Super 3.

Transcontinental air coach service, started by American Airlines and TWA on December 27, was under expectations during the first few weeks, but business was picking up as the service became better known. Both airlines were reluctant to release specific figures because they felt that initial patronage did not indicate the volume of traffic to be developed later. Passengers per flight were ranging between 30 and 35, yielding load factors at about the same lower winter level as those of regular schedules.

Next step in the Pan American-American Overseas merger case will come on March 1 when oral argument will begin before the Civil Aeronautics Board. Decision in the case, one of the most significant to come before CAB, is not expected before June.

The Federal Airport Program would be extended from 1953 to 1958 under S. 2875 introduced by Sen. Pat McCarran (D., Nev.). In support of this legislation McCarran pointed out that Congress has appropriated only 22% of the $500,000,000 authorized in 1946 as the Federal government's share of the original 7-year program. CAA contends that without the extension, the overall program will fall far short of its objectives and many airports will be only partially completed when the Act expires. The McCarran bill was referred to the Senate Interstate and Foreign Commerce Committee.

Capital Airlines has disclosed plans for buying five L-049 Constellations from Lockheed Aircraft Corp on a 36-month interest-free installment plan. J. H. Carmichael, Capital president, said he believed this was the first time an airline had arranged such an installment plan with a manufacturer. The planes, being turned back to Lockheed by KLM Royal Dutch Airlines which is getting long-range Connies, will cost $684,000 each. There will be no down payment and no interest, and payments will amount to $95,000 monthly.

Trans World Airline has purchased six more Lockheed Constellations for delivery in time for increased spring and summer schedules. The early-model L-049's were purchased from Hughes Tool Co., subject to CAB approval. These planes, plus 20 new ones on order, will give the airline a fleet of 61 Constellations when all deliveries are completed.

Turner Airlines, headquarters at Indianapolis, is the fourth and probably last feeder to be authorized at this time to operate single-engined equipment in scheduled airline service. CAB said it will not authorize, without prior study, any additional operations of this type until it can judge results of such experiments now underway. Other lines authorized for single-engined operations are Central Airlines, Wiggins Airways, and Mid-West Airlines.

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Volume 13 Number 17

Airport Approach Light Issue Revived; Slope Line Dropped

Action has been taken to abandon the slope line system of approach lights as the U. S. standard following recommendations of CAA Administrator D. W. Rentzel to a Munitions Board subcommittee. This action has yet to be endorsed by the higher echelons in the Munitions Board but approval appears certain based on the recommendations of Rentzel and the Board's technical staff.

It is expected that this will speed installations of approach light systems throughout the country and make it possible once more for all manufacturers of commercial lighting to participate in the approach lighting field. Commercial lighting ventures had been tested at Arcata, Calif., for a long period of time but adoption of the slope line approach light standard a year ago had sharply curtailed non-standard installations.

In making his recommendations to the ANC subcommittee on visual aids to air navigation, Rentzel revealed that investigation had shown that the slope line system can not be installed at 60% of the airports for which they were intended, primarily because of land procurement problems.

Terrain Problems

Other factors entering into CAA's recommendations were problems posed by terrain around the airport, unwillingness of foreign government to accept the standard for international use, and its unsuitability for military operations where the 1,000 foot overrun requirement existed.

CAA had also been under pressure from the Air Line Pilots Association, representing the largest single group of potential users, because ALPA objected to certain features of the slope line system. The primary objection appeared to be the double row of lights used in this system. ALPA has contended that only one row of lights should be used.

The subcommittee agreed to use ICAO recommendations in lieu of a U. S. standard until further evaluation and testing could be accomplished and a workable standard adopted. These recommendations include four basic systems, one of which is the slope line system. The others are the British Calvert system, the French proposal using a single left hand row with three transverse bars, and a low intensity system not identified with any given country.

This means that the slope line system of approach lights may continue to be installed on some scale at points where land is available and terrain is not too serious a problem. Rentzel has confirmed that there is no intention of discarding slope line light fixtures already ordered.

Rentzel also cited the tendency to confuse the two distinct items, the slope line lighting system and the slope line lighting fixture. He emphasized that there has been no criticism of the slope line lighting fixture and that what objections did exist to the system were based on the configuration in which the fixtures were installed. This is borne out by ALPA's recommendations that the lighting unit be used in a configuration of their design.

System In Use

A slope line approach light system is now in operation at New York International Airport and another is scheduled for completion in the near future at Washington National Airport. The Los Angeles Municipal Airport installation is also well along.

Terrain difficulties, which might accompany any lighting system to some degree, boosted anticipated cost of the Washington National Airport installation from $50,000 to approximately $153,000. The greater part of the price, $63,000, represents the cost of providing mounting piers in the Potomac. The inherent design of the slope line lights should minimize the need for special mounting structures in most installations but the pier costs for any system requiring a double row of lights would have been considerable.

Arcata Needs Funds

Brought into sharp focus by the change in policy toward the slope line system as the U. S. standard is the future of the Landing Aids Experiment Station at Arcata, Calif. This operation is the only coordinated test ground in the U. S. where military and civil groups have evaluated approach light configurations under actual flight conditions in a scientific program.

Located in one of the worst fog belts in the world, Arcata is the ideal proving ground for aids designed to simplify operations in marginal weather conditions. In the past few years the Navy and the Air Force have each contributed $200,000 annually to support the Arcata project and CAA has contributed $100,000 annually. Results have been cited throughout the world as a major contribution toward improved safety and greater regularity.

This year CAA reduced its budget request for the Arcata project to $50,000 based on the premise that this testing station will be discontinued after the next fog season early in fiscal 1951, the fall of 1950. CAA's Rentzel points out that experience with actual installations should contribute substantially to the knowledge on approach lighting. He

Turbo-Prop Convair—Consolidated Vultee Aircraft Corp. has submitted preliminary estimates to the Air Force on a turbo-prop powered version of the Convair Liner. The airplane would be powered by two Allison T-38 turbo-prop engines, each rated at 2750 equivalent horsepower. The T-38 installation would save approximately 2,000 pounds weight, according to Convair.

also indicated that he does not agree that the Arcata project is something which should be carried on indefinitely.

CAA has been appointed by the Air Navigation and Development Board to carry on evaluation of terminal area aids at its Indianapolis Technical Development and Evaluation Center. This may be interpreted to include lighting systems although no official outline of specific tasks has yet been issued. In this event, CAA would become the official organization to carry on all U. S. approach light evaluation.

Meanwhile Arcata is expected to have problems in continued military financial support although operations personnel are anxious that the work there continue. General Joseph T. McNarney's Defense Management Committee, intent on trimming the defense budget, has been giving a long look at Arcata and may not authorize the funds requested by the services for its support.

The Arcata station represents an investment of approximately $12,000,000. Through years of testing the organization has become highly efficient and has trained a valuable pool of manpower. The airport at Arcata belongs to Humboldt County. If funds are not available for operations beyond Jan. 1, 1951, the airport will be returned to the county, the equipment stripped out and returned to the individual participants and the $12,000,000 investment scuttled.

With continually increasing emphasis on operations during conditions of low visibility and ceiling, some industry groups feel that Arcata must be continued. They claim that the unparalleled weather conditions, off-airways location and similar features of this location can not be duplicated.

CAA Seeks Royalty Ruling In Welsbach Light Dispute

CAA has requested a ruling from the Office of the Comptroller General to determine the legality of making federal-aid grants for installation of high-intensity runway lighting on which special royalty fees have been paid. This is the latest development in the conflict between CAA and the Welsbach Corp. which caused CAA to suspend allocation of Federal funds towards runway lighting installations in June.

The Welsbach Corp. controls the J. B. Bartow patents and has levied a royalty of 80c per runway foot on all future runway lighting installations. After months of negotiations with Welsbach, during which all such lightings under federal sponsorship were suspended, CAA requested this ruling which may bring about a final settlement.

CAA's participation in allowable airport costs ranges from 50-75% which means its share of runway lighting costs would be increased by approximately $3,000 per airport. The local airport sponsor will be required to pay the balance of the royalty fee in the event that an agreement is finally reached.

New Martin 4-0-4 Transport Planned for Airline Market

A new model Martin transport, the Martin 4-0-4, will replace the Martin 2-0-2 if commercial orders are placed in the near future. Industry groups indicate that Martin has proposed several major changes in the Martin 2-0-2 which it is now offering to the airlines in a bid for the market offered by renewed airline interest in twin-engine transports.

The model 4-0-4 would have 3,100 pounds additional gross weight bringing take-off weight to 43,000. A longer fuselage, by approximately five feet, would be provided along with an additional row of seats which would bring normal seating capacity to 40 passengers with the possibility of a 44 seat version.

Another major innovation would be pressurization of the cabin and cockpit to enable routine flights at higher altitudes. The nature of the pressurization proposals has not been revealed. More power would be provided with the use of Pratt & Whitney R-2800 CB-16 engines using water injection and rated at 2,400 horsepower.

The Martin 4-0-4 is a design taken from the 2-0-2. It is not an attempt to revive the earlier Martin 3-0-3 design, according to those who have discussed the proposal with Martin.

Eastern Air Lines, TWA and United are the airlines with major fleets of Douglas DC-3's still operating. Eastern is operating about 50 DC-3's, TWA has 65 and United Air Lines has 70. Eastern and TWA are known to be actively considering replacements. In a recent talk Ralph Damon, president of TWA, mentioned the Martin 2-0-2 as one of the ships under consideration. Eastern has shown interest in the Martin post-war series throughout its history and at one time had orders for the 2-0-2 which were dropped for financial reasons.

BOAC to Discontinue Bermuda Service

British Overseas Airways Corp. last week announced the discontinuance of its service between New York and Bermuda on March 31, and the reopening of the mid-Atlantic service between London and Nassau via Bermuda with connections at Bermuda to Kingston, Panama, Lima, and Santiago.

The action came as a surprise to U. S. operators but was not regarded as indicating that BOAC may relinquish its rights to the route. Reason for withdrawal from the route at this time is the belief in London that the run does not have sufficient dollar generating power. The move will leave the field clear to Pan American and Colonial Airlines.

BOAC has operated the route since 1937 and until last year used Baltimore as a co-terminal with New York.

Top Approval— Shown in the cockpit of Pan American's Dehmel flight simulator for the Boeing Stratocruiser are, left to right, PAA President Juan Trippe; CAB's chief pilot, Col. Robert V. Garrett and CAB Chairman Joseph J. O'Connell. O'Connell and members of his staff visited Pan American to get first hand information on the Curtiss Wright-built simulator on which PAA has trained forty crews.

BELLANCA CRUISEMASTER cruises at 180 mph and has a maximum range of 680 miles. List price is $9,500.

Improved Models in Lightplane Field

By B. J. WARD

New models entering the lightplane sales market in 1950 give promise of improved operating performance at lowered costs. Also, modifications have been made on existing models to increase their utility for training and to shorten take-off and landing runs. New information on four craft became available last week.

The Bellanca Cruisemaster, a four passenger plane with cruising speed of 180 mph and stalling speed of 43 mph will be exhibited to the public for the first time at the National Sportsman's Show, February 18-26, in New York.

The Jamieson Jupiter designed by C. M. Jamieson, formerly chief engineer at Culver and later design engineer on the Beechcraft Bonanza, is approaching certification by the Civil Aeronautics Administration. The manufacturer states that the plane will not stall or spin, cruises at about 155 mph and stalls well below 40 mph. The front seat of the plane accommodates three persons and the baggage compartment can be converted to carry two children.

The 1950 Ercoupe has a new optional feature which provides for rudder linkage to convert the plane to a conventional type, three-control plane. The "trim-o-matic," a spring-weighted lateral trim control to increase the plane's stability for hands-off cross country flying, is now under flight test by CAA and will be incorporated in the 1950 Ercoupe as soon as it is approved.

The 1950 model Beechcraft Bonanza includes 18 new features. The four-place B-35 cruises at about 176 mph and stalls at about 56 mph with 30 degrees of flap. Takeoff run of the aircraft has been decreased approximately 18% and landing run has been decreased approximately 26%.

Details on each of the aircraft follow.

Bellanca Cruisemaster

The new Bellanca Cruisemaster is a four passenger low-wing monoplane with hydraulically operated flaps and landing gear. The plane cruises at about 180 mph, lands at about 43 mph and has a rate of climb of 2,000 from solo and 1,400 fpm at full gross load. It is powered with a Lycoming Model 0-435A, 190 hp engine with a Hartzell HC-12x20-8 propeller.

Takeoff distance required to clear a 50′ obstacle at sea level is 1343′ and landing distance required to clear a 50′ obstacle is 1103′.

Empty weight of the plane is 1525 lbs., gross weight is 2600 lbs. and wing loading at gross weight is 16.09 lbs. per sq. ft. Wing span is 34′2″ and length of the plane is 23′.

Service ceiling is 22,500′ and the plane has a maximum range of 680 miles on 40 gallons.

The flap and gear levers are located for easy access at the base of the front seat between the occupants. The gear lever is in the shape of a landing gear and the flap knob is in the shape of an air foil section, in order to minimize possible errors of operation. An auxiliary manually operated pump guarantees hydraulic pressure if the electromatic actuator fails to function properly. In the event that a hydraulic line is fractured, the gears snap into extended and locked position upon release from the "up" position.

The interior of the plane is in flameproof nylon fabrics trimmed with leather and comes in the Cruisemaster's three standard colors—red, yellow and blue. The instrument panel includes turn-bank and basic engine and flight instruments as well as a Mitchell radio (formerly Motorola) with two-way VHF, a low frequency and 75 MC marker beacon receiver and provision for omni-directional modification.

Additional features include a ten cubic foot exterior baggage compartment which accommodates 198 lbs., steerable full-swivel tail wheel, fixed landing lights and position lights.

Bellanca Aircraft Corp. will have the plane on display for the first time at the National Sportsman's Show in New York City. The first production unit of the Cruisemaster was sold last month at list price of $9,500.

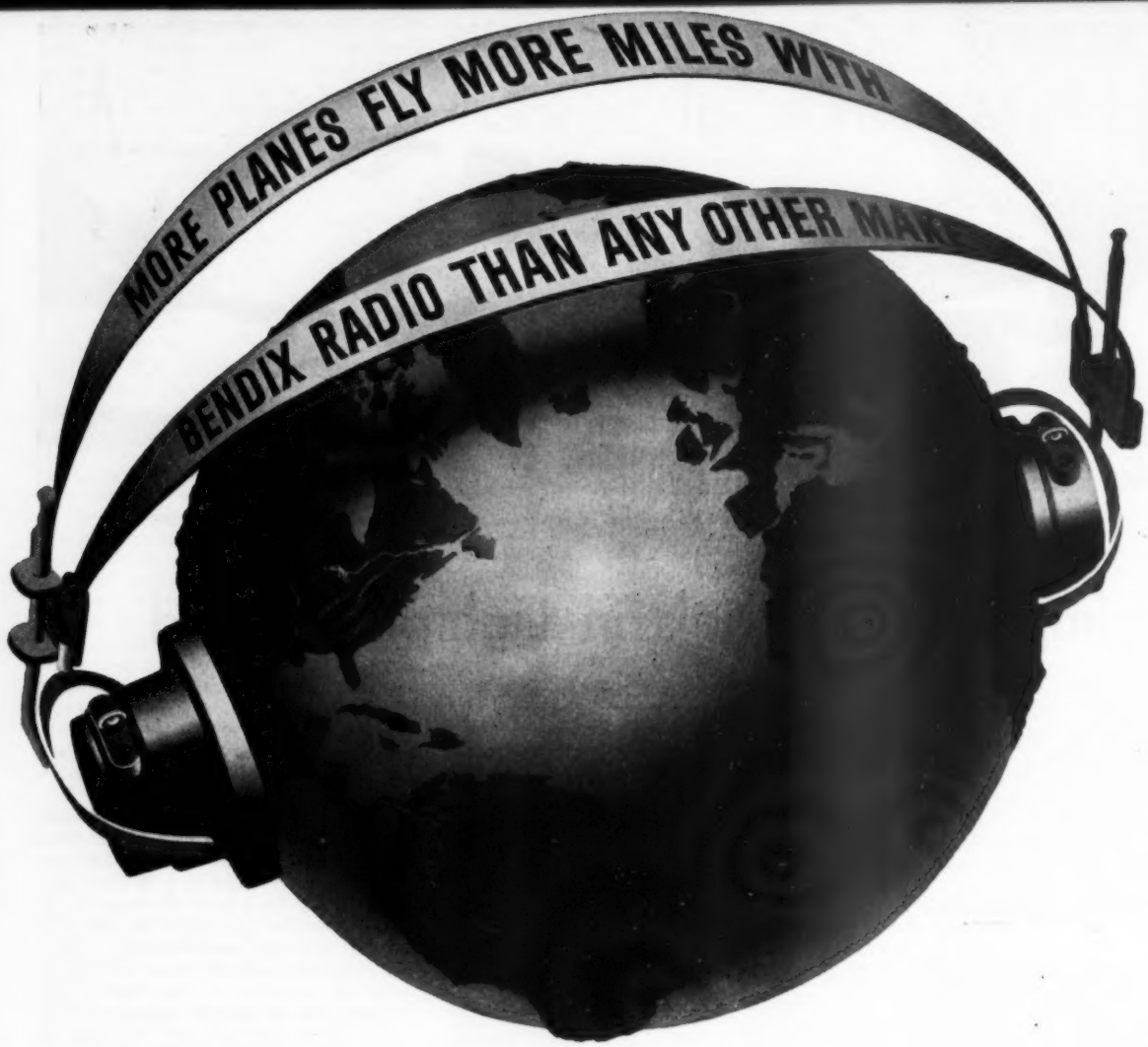
Helioplane Deal Near

Aeronca Aircraft Corp. and Helio Corp. are reported nearing final agreement on terms under which the former would manufacture the four-place Helioplane which co-designers Dr. Lynn Bollinger and Dr. Otto C. Koppen hope to enter in the lightplane market this year. A draft of a contract covering the proposed licensing arrangement was submitted by Aeronca to Helio Corp. several weeks ago and there was said to be no major differences to be settled.

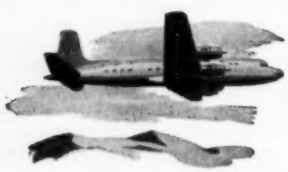
Tooling and production matters have already been discussed by Aeronca engineers and the designers. First indication that Aeronca would build the revolutionary lightplane for Helio Corp. was given in AMERICAN AVIATION last November 15.

Jamieson Jupiter

The Jamieson Jupiter, now nearing completion of CAA certification tests, is



Whatever the Plane or Purpose . . .



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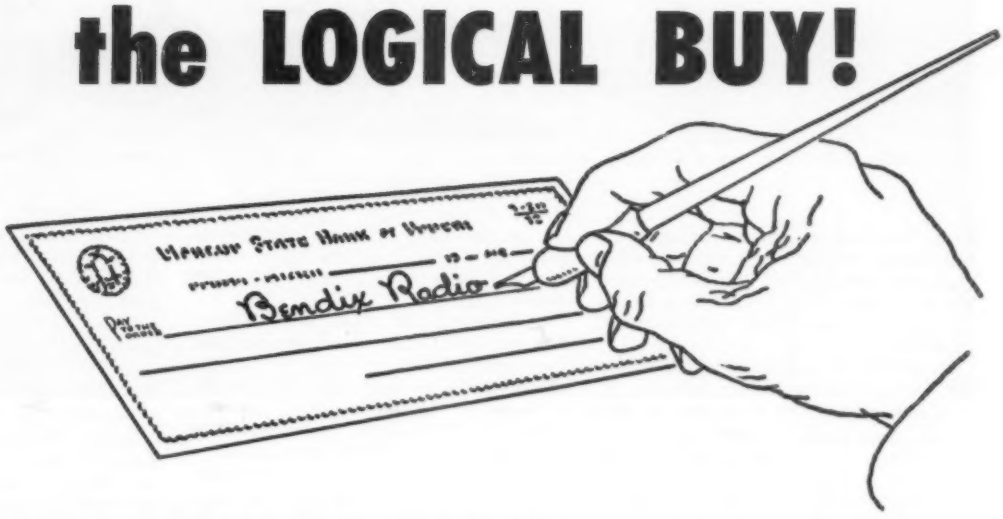

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JAMIESON JUPITER is now undergoing CAA certification tests. The manufacturer claims unusual performance characteristics and a price of $2,500.

an all metal, low wing monoplane with retractable tricycle landing gear. Length of the aircraft is 20'10" and wing span is 29'. It is powered by a Lycoming 0-235-C1 115 hp engine with a fixed wood propeller.

Empty weight is 800 lbs., gross weight 1600 lbs. and wing loading 12.98 lbs./sq. ft. Useful load is 50% of its gross weight.

The plane climbs at 1,000 fpm with a fixed pitch wooden propeller or 1,500 fpm with a controllable pitch propeller, and cruises at about 155 mph with a range of 700 miles. Gas capacity is 30 gallons and oil capacity is 6 qts. Stalling speed of the plane is listed at 40 mph but the manufacturer states that the actual stalling speed is far below this speed and may be below 30 mph.

The plane's front seat accommodates three persons and has seat belts attached to the front wing spar to take the loading off the seat. It is unusually roomy, with the same seat height, seat width and foot space as a popular make 1940 automobile.

The instrument panel was designed for simplicity, the glove compartment has space 19"/19"/9", and the baggage space behind the seat allows for 257 lbs. of baggage. Metal jump seats are provided in the baggage compartment to carry two children if this is preferred.

The company states that normal takeoff run to clear a 50' obstacle, no wind, is 300' and that landing run under the same conditions is 200'.

According to Ross Holdeman, vice president of the Jamieson Aircraft Co., interest in the plane's unusual performance is evidenced by the fact that in the past six months over 25,000 inquiries concerning the Jupiter have been received.

Selling price of the plane, which will be entered in the Air Force's light plane observation-reconnaissance design competition in April, will be only $2,500, Holdeman said.

Warning for Pilots

Pilots using anti-histaminic drugs in treating colds should not operate an airplane unless they are certain that the drug causes no side reactions in them, the Civil Aeronautics Administration's Medical Division warned last week.

It would be dangerous for those who experience side reactions, such as drowsiness or dizziness, to operate planes while taking the drugs, CAA declared.

The CAA Medical Division recently cautioned against operating airplanes while taking dramamine, an anti-histaminic drug used as an airsickness remedy. Some of the newer anti-histamines, in dosages recommended for cold treatments, are claimed to be less likely than dramamine to cause side reactions, but no pilot should overlook the possibility that he might be particularly susceptible.

1950 Ercoupe

The 1950 Ercoupe Club Air will incorporate a lateral trim control to make "hands off" cross country flying easier than before, according to the manufacturer. The "trim-o-matic" is a spring device to provide lateral trim control and can be adjusted in flight to correct for torque resulting from varying power settings and to correct for unequal loading in the cabin. The device, which is in the last stages of CAA flight test, will be added without increasing the price of the Ercoupe.

Also new is provision for converting the Ercoupe, a two-control plane without foot rudder controls, to the conventional three-control type aircraft. The three-control feature will be optional on 1950 Ercoupes and a conversion kit will be made available so that operators who wish to convert their Ercoupes to three controls can do so themselves. The rudder assembly kit will cost $150 and installation of the rudder assembly will take about one work day.

Since the 1950 Ercoupe will come off the assembly line with the two control system and must be converted, the cost of the three control Ercoupe will be $150 above list price of $3,995.

Robert Sanders, president of Sanders Aviation, Inc., which holds the rights to the Ercoupe, says that the decision to make the Ercoupe available in the three-control version "has been dictated by the change in the attitude and regulations regarding spins.

Model B35 Bonanza

The most outstanding improvement in the new Model B35 Beechcraft Bonanza is the decrease of takeoff run by approximately 18% and decrease of landing run by approximately 26%.

For takeoff, horsepower rating has been increased from 185 hp at 2300 rpm to 196 hp at 2450 rpm without forcing the powerplant to deliver its maximum output. The new electrically controlled, continuously variable pitch Beechcraft B-200 propeller which has a propeller efficiency of approximately 85% adds to performance, and faster retraction of the gear (8½ seconds compared with the previous 13½ seconds) decreases drag for clearance of obstructions. Takeoff run at sea level, 10 degrees flaps and 10 mph wind, is 580'.

For landing, the new 30 degree flap extension gives the Bonanza a higher rate of sink without affecting the rate of stall. Action time has been reduced for both extending and retracting the flaps. Landing run now is approximately 627 feet at sea level using 30 degrees flaps in 10 mph wind.

Deliveries of the new model Bonanza have begun, with 16 of the planes in the hands of dealers and distributors. Beech Aircraft Corp. has a backlog of orders for about 100 of the B35 Bonanzas.

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SOUTHWEST AIRWAYS USES DEPENDABLE CHAMPIONS IN WINNING TWO CONSECUTIVE NATIONAL SAFETY COUNCIL AWARDS

From its first take-off in December, 1946 to the present, with about 60 million passenger miles behind it, Southwest Airways hasn't had an accident. Under normal circumstances that would be record enough; being a feeder line stopping at 33 cities and towns averaging 45 miles apart from Medford, Oregon to Los Angeles, it is a truly outstanding achievement! The National Safety Council gave Southwest its last two Aviation Awards.

Southwest is famous for the short time it spends on the ground between landings and take-offs . . . they average about six minutes, sometimes stop-start in one minute flat! The extraordinary strain on spark plugs from frequent use of full-throttle and unusual taxiing and engine idling is readily apparent. Southwest, however, like most airlines, uses Champion Spark Plugs and reports them completely dependable. Their fine record bears out this statement.

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New Link Jet Trainers Pace Aviation Developments

By JAMES J. HAGGERTY, JR.

Remember the old, stubby, sharp-cornered Link trainer in which thousands of war-time pilot trainees learned the rudiments of blind flying? Well, like the airplanes of its day, it has been completely outmoded by the rapid post-war progress of aeronautical development. Although there are still some of them in use, the war-time Link is now as obsolescent as the Flying Fortress.

But, just as sleek, 650-plus-mile-an-hour jet aircraft have replaced the 300-mile-an-hour "klunkers" which fought the war, a new family of ground-based trainers, as superior in every respect to the war-time Link as the jets to the klunkers, has been developed.

The company which developed the old instrument trainer, Link Aviation, Inc., of Binghamton, N. Y., has a completely new line of training devices, including a pair of jet trainers, a ground-based replica of the Navy SNJ flight trainer, a new celestial navigation trainer, a radio aids trainer and a couple of other trainers which the military services won't permit Link to talk about.

Two Jet Trainers

Perhaps Link's most interesting projects are the two jet trainers: the C-11, based on the Lockheed F-80 jet fighter, which Link is building for the Air Force, and a replica of the Douglas F3D-1 Skynight, which is being built for Navy use. The company is building four F3D-1 trainer units, complete with a mobile trailer unit for easy transportation from one air station to another; the first one will be delivered early this spring.

The Air Force has so far ordered only one prototype of the C-11 Jet Instrument Trainer, as it is called, and this has been completed and shipped to Wright-Patterson Air Force Base, where it is undergoing testing now. Link expects to get a production order for about two or three C-11's a month; the production models, however, will probably duplicate the instrument panel and flight conditions of the North American F-86 Sabre rather than the F-80.

The old Link trainer was used only for instrument training and it pitched, banked and turned on a single pivot base. In both respects, the new jet trainers differ. They are not only instrument trainers, but rather combinations of three trainers: flight, engine operation and radio navigation. And they do not move on their fixed bases, although the trainee in the cockpit can bank them, roll them and duplicate every flight maneuver in the book as far as the instruments are concerned.

New Instruments

To give you an idea how the jet trainers work, let's take a typical training "flight" in the C-11 trainer, which simulates the cockpit, flight performance and engine operation of the Lockheed F-80.

The trainee sits under the blackened hood (see photo). Before him he has all of the instruments and controls required to "fly" the F-80, plus several newly-developed instruments which have not yet been installed in many aircraft. A couple of feet behind him, at a master console panel, sits the instructor. The instructor has a duplicate set of instruments on his panel; in addition, he has a series of 23 lights which tell him just what errors of operation his pupil is making, for instance "Incorrect Throttle Setting," "Exceeding Mach Number," "Exceeding 101% RPM," or "Engine Disabled."

He also has a set of switches which permit him to plague the pilot with engine failure, fuel pump failure, pitot and wing ice, hydraulic system failure, etc. He can even introduce winds from any direction up to a 150 mile-per-hour velocity. Finally, he has a map upon which the course of the "airplane" is charted by an inked needle.

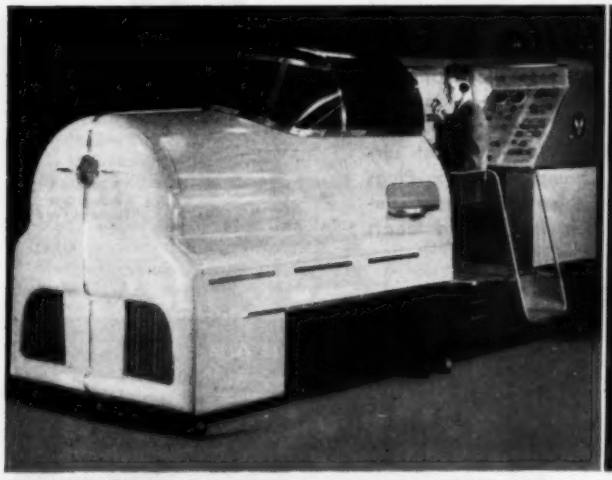
Adds Realistic Touch

The trainee runs through his check procedure, just as he would in a plane, and takes off. All of the instruments react exactly as they would in an actual take-off; realism is simulated even to the whine of the engine. Once in the "air," the pilot points his plane toward his cross-country destination.

Now here is where the "plague" switches come in. The designers of the trainer felt that, in the past, instrument trainer instruction failed to present enough of the problems which would actually be encountered in an airplane. The trainee was able to concentrate solely on his radio navigation and the instrument phase of the training. As a result, when he transferred to a plane, he was proficient enough in instrument flying and radio navigation, but he became too easily confused by the myriad of other details requiring his attention, such as proper engine operation, fuel management, and dealing swiftly and efficiently with emergencies.

Emergencies Simulated

So the instructor may inflict a couple of emergencies on his student and watch his reactions. He may, for instance, introduce a higher rate of fuel consumption; the pilot must quickly decide whether he can reach his original desti-



LINK AVIATION'S C-11 Jet Instrument Trainer (left), which is patterned after the Air Force's Lockheed F-80 jet fighter. The trainer does not move on its base, but it can simulate (instrument-wise) every flight maneuver possible in the F-80. Pilot is under hood, instructor (shown) sits at master console panel. Realism is stressed, even to the noise of the engine. Fourteen feet long, the trainer is built in quarters (note rollers) so that it can be moved through narrow doors. Link's SNJ trainer (right), 28 of which are being built for the Navy. Like Link's jet trainers, the unit is a three-way trainer—flight, engine operation and instrument.

nation or whether he must alter course for an alternate base. Or the instructor might cause the fuel pump to fail, so that he may watch the student's air starting procedure. Should the pilot fail to handle any of the induced emergencies, the instructor has an "Engine Re-Set" switch, by which he may give him a "new engine," or a fresh start.

For navigation purposes, the instructor may introduce a strong cross-course wind, which will blow the plane (or the inked needle) off course on the console map. It is up to the pilot to get back on course by means of his radio instruments.

Space permits the listing of only a few of the things the trainer can do; suffice to say it can duplicate any condition of flight, from a climbing turn to a flat spin and crash, if the instructor wills it.

Split for Mobility

The C-11, or Air Force jet trainer is 14 feet long, including the instructor's console, and weighs 3,750 pounds. It is built in four sections and split down the middle, so that it can be moved through narrow doors. The Navy's F3D-1 trainer differs in that it is mounted on a large mobile trailer, which is air conditioned for use in any climate and which may even be taken aboard a carrier. The F3D-1 trailer is also equipped with a radar interception trainer, about which nothing can be said for security reasons.

In addition to the two jet trainers, Link is also building 28 models of the SNJ (Air Force T-6) basic trainer, deliveries of which will start in about a month. Like the two jet trainers, the SNJ trainer duplicates all of the flight conditions of the actual airplane. The cockpit is not a replica of the SNJ; it is *actually* an SNJ.

Link buys surplus SNJ's, cuts out the section from behind the engine to the rear of the cockpit and uses it as the basis for the trainer. The SNJ trainer also has the "trouble controls" with which the instructor may plague his student, and in addition to duplicating the flight performance of the SNJ, the trainer even duplicates the feel of the stick and the sound of the engine.

Navigation Unit

The navigator has not been forgotten in the development of new training devices. Link now has under construction a celestial navigation trainer, permitting the navigator to "fly" an actual cross-country flight with his octant by "star-shooting." The stars are arranged on an overhead dome, which moves across the navigator's line of vision, simulating the actual movement of the stars on a long night flight.

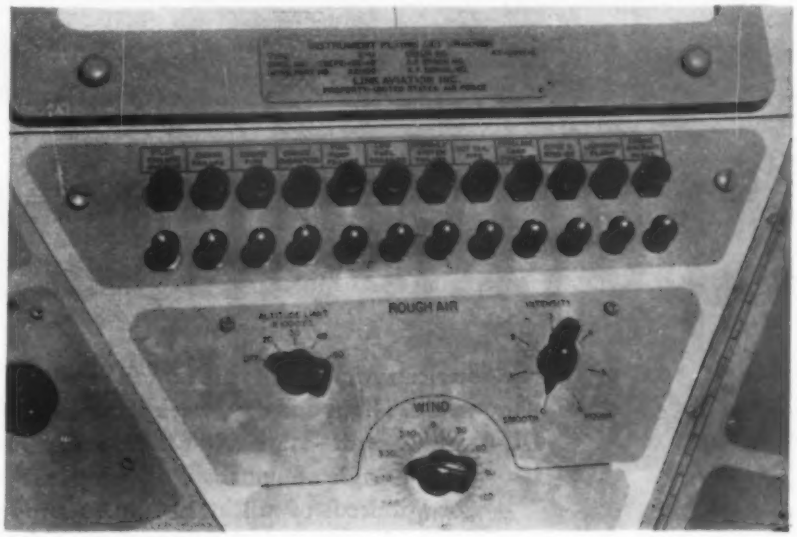
The celestial navigation trainer is not new; it was used throughout the war. Link's new model, however, is an improvement of the war-time CNT, as it was called. The principal improvements are the speed of the star-dome and the latitudes available. The new model will permit simulation of aircraft speeds up to 1500 miles per hour and it also provides star formations which would be encountered in polar navigation, not previously available.

THE NAVY'S F3D-1 Link Trainer, mounted on a trailer for easy transportability. To the extreme left is a replica of the cockpit of the Douglas F3D-1 jet fighter. Behind it is the instructor's master control panel, with which he can observe the pilot's handling of the 'plane' and simulate flight emergencies. At right is the electronic mechanism (boxed in) which operates the trainer.

The fact that the basic radio navigation aids are in the process of change started a new Link development, the All-Weather Automatic Radio Aids Unit. Link predicts that the low-frequency radio range will be abandoned in five to seven years, to be replaced by the Omni-Directional Range System, DME (Distance Measuring Equipment) and Arbitrary Course Computers. Present pilots, and those coming up, will have to be trained in the use of these facilities. Thus the AWARAU.

The AWARAU simulates all existing and projected radio navigation aids that are a part of the Interim Facilities Program. Further, it enables, for the first time, the reproduction of a number of radio stations simultaneously, so that the pilot may be taught in a realistic navigation situation.

The practical value of these training devices is shown in a study conducted last summer by the Department of Psychology of the University of Illinois. Two groups of six students, none of whom had previous flight instruction, were trained to master specified exercises in the air. One group trained in aircraft alone, the other in aircraft and Link. The latter group took 43:36 air hours less to become proficient, making fewer mistakes in the process and requiring fewer trials. Cost—$3,572 for the group in aircraft alone and $1,572 for the group trained in aircraft and Link.



THIS IS the "trouble panel" of the C-11 Jet Instrument Trainer. By twisting a knob, the instructor can simulate any of the emergencies shown above the knobs. The knob at the right permits him to give the pilot a "new engine," or a fresh start, after failure to meet the emergency. Instructor can also introduce rough air and winds up to 150 mph from any direction.

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PANORAMIC VIEW of DC-6 windshield taken by camera mounted in captain's position. Left window matches one beyond co-pilot's seat.

Improved Cockpit Visibility Sought

A comprehensive study to determine the quantity and quality of cockpit visibility in present-day transport airplanes is now being conducted by CAA. At its Indianapolis Technical Development and Evaluation Center engineers, technicians and pilots are working with all types of devices to determine what the pilot must see to make accurate judgments in operating the airplane and permit him to see other aircraft as required.

Since "no consistent standards" or requirements exist with regard to minimum visibility safely allowable, the TDEC is proceeding along several channels in its attempt to provide useful data to the industry. This includes a survey of all airline pilots, photographic recordings of present-day transports, studies of the optical characteristics of windshields and determination of necessary angles of vision to avoid collision on the basis of aircraft operating characteristics.

The survey of airline pilots was made through the Air Line Pilots Association and involved some 6,000 questionnaires of which over 25% were returned completed. The results of this survey have been tabulated and recorded on punch cards for ready reference. It is expected that the results will be released for general use in the near future.

The questionnaire first established the competency of the pilot by checking on the number of years of flying, hours flown, and classification. Following this, three drawings and numerous tables were used in the nine-page report to make it easy to answer and insure compatible answers.

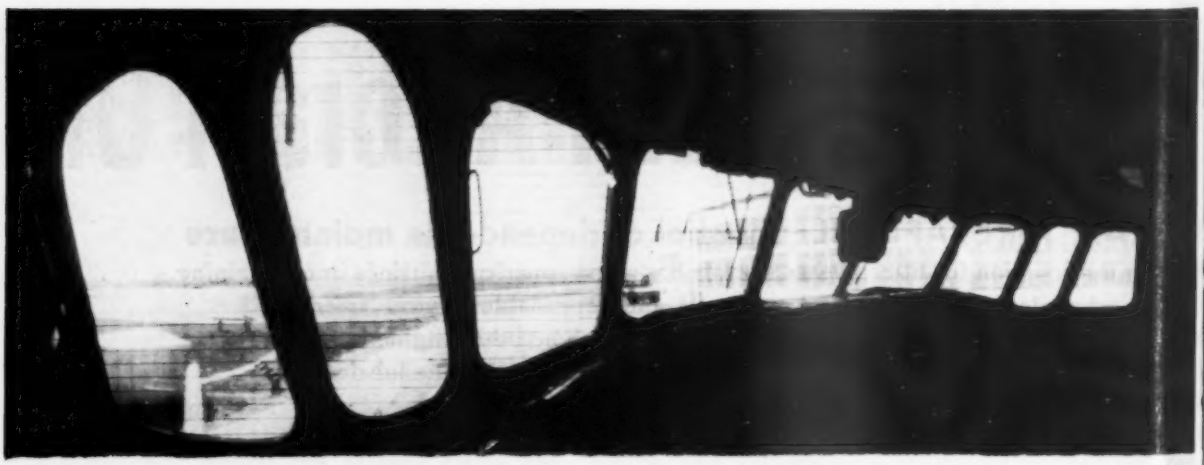
Pilots were asked what parts of the aircraft they considered must be visible from the cockpit; in what maneuvers, on the ground and in the air, maximum visibility was necessary; in what horizontal regions windshield and window distortion is most critical; in what areas are cockpit obstructions critical, etc.

One set of questions determined what type of aircraft the pilot was primarily associated with and then asked him to use one of three terms provided in describing his opinion of visibility in this aircraft during nine distinct maneuvers.

Pilots were also asked for a record of any instances in their experience in which poor visibility had contributed to an accident or near accident and under what conditions.

Another phase of CAA's program involved mounting a rotating panorama-type camera in the cockpit at the eye level of the pilot in the captain's seat and making a photographic record of the field of vision. The photos show typical results with the Douglas DC-6, Lockheed Constellation and Convair Liner.

Another special camera of this type, which incorporated dual lenses to simu-



VISIBILITY FROM Constellation cockpit as photographed by CAA in Indianapolis tests. Investigations included a survey of 6,000 pilots.

CONVAIR-LINER cockpit. Grid markings, not part of windshield, were superimposed on pictures for comparative purposes.

late the binocular effect of the pilots two eyes, is now under construction at Indianapolis and is expected to provide considerably more data.

This system of measuring the limiting angles of cockpit vision from in the cockpit replaces the older method which CAA technicians found "too slow and cumbersome for routine use." The old method involved telescopic sighting and manual plotting of the field of vision.

Another phase of this evaluation is now being prepared which involves flight studies of pilot eye movements during all phases of operation. This will probably be carried out in the Boeing Stratocruiser or in some other airplane with good visibility characteristics.

Preliminary flight tests already made in this program indicate that it will be possible to determine critical windshield areas and basic visual cues used by the pilot in making judgments.

Determining Distortion

Studies have shown that windshields with appreciable distortion can influence pilot judgment of distance, height and position when such judgments are critical. The trend in this direction is more noticeable with the thicker laminated windshields now being used for bird collision protection. To determine the exact dimensions of these problems CAA is attempting to develop precise methods of measuring optical characteristics of windshields.

One method now being used for this purpose involves taking photographs of reflections of a grid placed on the windshield surfaces. The deviation of light rays from a straight line provide an accurate means of measuring distortion.

It is hoped that, as a result of all of these various approaches to the visibility problem, definite standards can be set up based upon specific and acceptable test data," CAA stated. "If this can be done, a definite advance will have been made toward greater safety in aircraft operation."

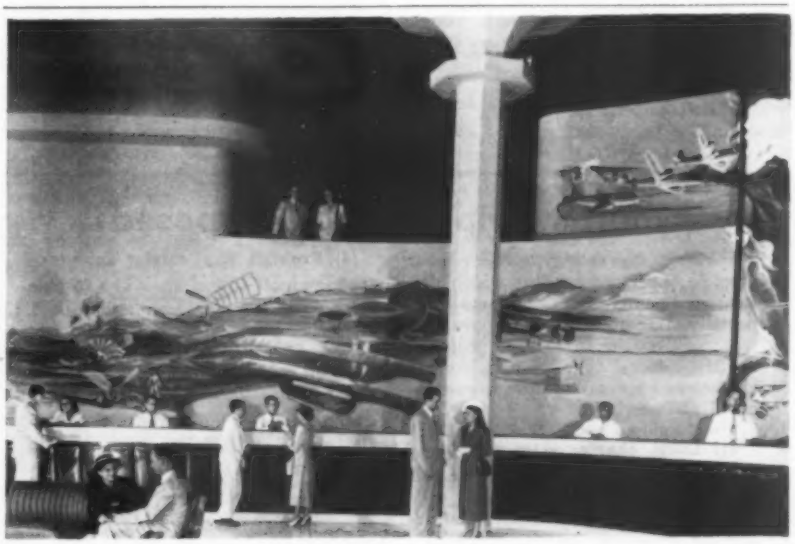
Commutation Tax Ruling Pressed by NWA Refunds

The question of whether an airline must collect the 15% transportation tax on commuter books is expected to be answered soon by the Bureau of Internal Revenue because of a practice adopted by Northwest Airlines in connection with the sale of this type of travel.

On January 1 NWA started the sale of six-ticket books between four sets of domestic points without collecting the tax. Internal Revenue, which has never given the airlines a definition of exactly what is involved in "commutation," said it was investigating the situation.

NWA subsequently changed its procedure and, at present, when a passenger buys a commuter book, he pays the 15% tax. He then signs a refund receipt, and the tax is refunded to him on the spot. NWA pays the tax to Internal Revenue and files application for refund from the Bureau.

The Bureau's hand will thus be forced. If it refuses the refund, NWA may bring suit against the local Internal Revenue collector in District Court. The refund is requested under Sec. 3469 (b) of the Internal Revenue Code, which states that the tax shall not be collected on commuter travel confined to one month or less. Thus, the airlines can expect a decision on commutation—a decision they've been trying to get for two years.



New Havana Office— A mural which depicts the evolution of the airplane covers the entire semi-circular wall at the rear of the new Havana sales office of Pan American World Airways and its affiliate, Compania Cubana de Aviacion. The mural is 30 ft. high with a 75 ft. sweep. Offices opened Jan. 6.

CAB Crack-Down Brings End Nearer for Non-Skeds

By William V. Henzey

Non-scheduled air carrier activities are being curbed with increasing frequency by the Civil Aeronautics Board through use of its enforcement powers. In the past seven months, no less than 15 large irregular carriers have been ordered to show cause why their letters of registration should not be revoked outright and the end is definitely nearer for much of the non-sked airline industry.

Comprising this 15 are most of the major carriers in the non-sked field. Most recent was Air America, Inc., accused of operating too frequently between New York and Los Angeles, among other things. Others include Viking Airliners, Trans Caribbean Air Cargo Lines, Arrow Airways, Economy Airways, Meteor Air Transport, and Trans-American Airways to name a few.

In addition, three others have been involved in investigation proceedings designed to curb further violations of the Civil Aeronautics Act, bringing to 18, the total of enforcement or investigation proceedings instituted since June 20, 1949, the non-skeds' deadline for filing applications for individual exemptions under the then-new Economic Regulation 292.1.

No Direct Action

Ninety-six applications were filed at that time, but to date not one has been acted upon directly by CAB with the result that operating privileges have remained in effect. Yet, the Board has embarked on a highly-effective campaign which, in light of the carriers involved, will wipe out all but a skeleton number, without even opening an exemption docket.

The enforcement proceedings instituted in the past seven months are not the hand-slapping type that characterized the years prior to promulgation of the present regulation. Then, it was simply a case of ordering a carrier to cease and desist from violations of the Act and regulations. Except in very isolated cases, the continued operating rights of the violators were not involved.

The present type, however, has as its ultimate aim revocation of the letter of registration which the non-sked needs to continue operations as an air carrier. Such revocation, of course, is also tantamount to a denial of the carrier's exemption request, although a separate order of the Board must be issued for the purpose.

Numerically, the Board's program does not yet sound imposing. At the present rate, it would take four years to eliminate the 96 lines awaiting action on exemption applications, assuming all had violated and were detected violating the Act. But the size of the carriers involved and the increased frequency with which CAB is instituting these proceedings give strong support to the theory that the heart will be taken out of the non-scheduled industry via the enforcement method.

Actually, keeping CAB's regulations in mind, the enforcement proceeding is brought on by the non-sked itself. Certain standards are outlined and the operations must be within those standards. If violations are detected, the carrier is warned, usually several times, by CAB. If violations continue they are termed "knowing and willful" and the Board's enforcement attorneys file a motion for institution of proceedings. Past record and the extent of the violations determine whether the proceedings are aimed at revocation of operating rights, or curbing of unlawful activities.

Granting this, however, the method adopted by the Board was entirely unexpected if considered in the light of publicity attached to promulgation of Economic Regulation 292.1 last spring.

It was April 18, when the regulation was issued and it required every non-sked desirous of continuing in business to file an application, no later than June 20, for an individual exemption to replace the blanket exemption under which all were then operating.

The non-skeds embarked on a fairly large-scale campaign to block the regulation claiming it would mean the end for them, as a blanket-denial of the exemption applications was anticipated by many. This resulted in considerable intervention by the Senate Interstate and Foreign Commerce Committee, headed by Senator Edwin C. Johnson (D., Colo.), which sought what was termed a "stay of execution" for the non-skeds, at least until CAB had acted on their various applications for air coach certificates.

Delayed Effect

The regulation went into effect, however, but the immediate wiping out of the large irregulars did not take place as expected. On the contrary, the non-skeds have continued to participate heavily in the low-cost travel market of the country.

For September of last year, for example, there was an estimated number of available seats in excess of 7,000 offered by these carriers between Newark, New York and Burbank, California. The number exceeded 5,500 between Chicago and Burbank, and 5,400 between Chicago and New York/Newark. Load factor figures are not readily available, but none of these lines are operating without a payload near or at capacity.

Nevertheless, after seven months the real effect of Regulation 292.1 is becoming apparent. More and more, the carriers violate its terms and give cause for CAB action.

Another and highly-contributing factor to the weakening of these carriers as a group is the increased air coach activity of the scheduled industry. Transcontinental operations of American Airlines and TWA with high-density equipment is only the start of a campaign which openly has as one of its purposes, diversion of low-fare traffic from the non-skeds.

The lucrative Miami winter market is being absorbed by Eastern Air Lines, National Airlines, and Delta Air Lines, despite lowest-in-history fares of the non-skeds strenuously attempting to hold on. This is also the case in other areas where the certificated lines moved in with coach services.

In general, the noose is being drawn tighter and only those which can refrain from violating the Board's requirements while effectively competing with scheduled coach service stand much chance of making an issue of exemption applications.

Whether or not any of these lines will be issued coach certificates is a question now being discussed at public hearings.

Charter Trip Control Proposed

Showing increasing concern over possible economic dangers which unregulated charter trips may entail, especially in foreign and overseas transportation, the CAB has proposed its first general regulation to control charter and special services of certificated airlines.

The proposed regulation would:

(1) Limit charter service for any calendar quarter to 5% of the air transportation (on an airplane mile basis) performed by the carrier during the preceding calendar quarter.

(2) Require that no charter trips be performed except pursuant to a bilateral agreement in writing signed by both parties.

(3) Prohibit any carrier from operating an off-line charter to a foreign point or area for which another U. S. carrier is certificated, unless the latter consents in writing to the charter, or CAB grants specific authority in the public interest. This, CAB said, would prevent the "pirating" by an air carrier of traffic in the legitimate field of another.

(4) Restrict charter operations of all-cargo carriers to the transportation of property only.

Comments on the new regulation, designated as Part 207, should be made to the Board by Febraury 15.

CAA, CAB Budgets for Fiscal '51

House and Senate appropriation subcommittees are expected to start hearings later this month on budgetary requests of the Civil Aeronautics Administration, which with contract authorizations, total $212,555,000 for fiscal 1951 or an increase of $68,688,098 over fiscal 1950.

The largest single increase is for establishment of air navigation facilities in the amount of $40,500,000 compared with $18,650,000. Involved in this item is $14,000,000 in cash and $26,000,000 in contract authority.

Appropriations for the Federal Airport Program are increased by $36,800,000 from $14,500,000 in 1950 to $51,300,000 for 1951. Of the total amount, $48,000,000 is for liquidation of obligations of contracts made under authority contained in the 1950 act. New contract authority is granted in the amount of $36,700,000 for grants-in-aid to states and territories under the Federal Airport program.

A table of CAA budget requests, by items, follows:

	1950	1951
Salaries and expenses	$ 94,402,105	$104,250,000
Establishment Air Navigation Facilities	18,650,000	40,500,000
Technical Development and Evaluation	1,450,000	1,475,000
Maintenance and Operation, Washington National Airport	1,250,000	1,355,000
Construction, Washington National Airport	196,500	1,590,000
Federal Airport Program	14,500,000	51,300,000
Damage Claims	777,297	.....
Public Airports, Alaska	5,800,000	3,200,000
Air Navigation Development	3,000,000	8,885,000
Total	$140,025,902	$212,555,000

The President's budget for the Civil Aeronautics Board calls for an appropriation of $4,323,000 for fiscal 1951 compared to $3,620,500 appropriated in 1950, or an increase of $702,500. The major increase is in the division of Economic Regulation amounting to $414,405 over 1950 estimates.

Obligations by activities are shown in the following table:

	1950 estimate	1951 estimate
Executive Direction	$ 204,194	$ 207,097
Economic Regulation	2,049,036	2,463,441
Safety Regulation	341,300	368,068
Accident Investigation	658,753	760,045
Administration	367,217	401,349
Pay Increases	77,000	123,000
Total	$3,624,763	$4,323,000

Miami Air Show Highlights

Newest thing on the flight line at the All American Air Maneuvers held at Miami January 13-15 was the Fouga Cyclone, the first light plane to be powered by a jet engine.

The plane, brought from France by pilot Fred Nicole and Marcel Doret, is a remodeled single-place glider with a Turbemco TR-O11 jet engine which sells for about $2,200 and can be installed in any properly designed light plane. Its sponsors hope to find a market for the engine in this country.

The jet engine is located on top of the fuselage of the "Cyclone," in back of the pilot, in such a way that the exhaust passes back over the fuselage and between the butterfly or "V" tail fins. Sea level top speed of the aircraft is 153 mph, rate of climb 790 fpm and ceiling 28,000 feet.

Weight of the engine is 120 pounds and it approximates in power output a 200 hp reciprocating engine, which would weigh about 460 lbs.

Upset of the air show was the winning of the Gulf National Aerobatic Championship by a newcomer to big time air shows, Rodney Jocelyn from Langehorn, Pa. Beverly E. ("Bevo") Howard, winner in '46, '47 and '49 competed with his German Jungmeister but Jocelyn, in his old Great Lakes trainer with a 165-hp Kinner engine, scored 1,068 points to Howard's 995.3 points. Betty Skelton placed third with 848.3 points in her 90-hp Lycoming-powered Pitts Special.

Steve Wittman in his "Bonzo" held his 1949 position as winner of the Continental Motors Corporation Trophy Race against some close competition from Keith Sorenson's "Cosmic Wind" with an average speed of 185.400 mph to Sorenson's 182.044 mph.

CAB CALENDAR

Feb. 1—(Docket 4022) Hearing on application of Transportes Aereos Nacionales, S. A. for Foreign Permit (Miami-Havana-Tegucigalpa). 10 a. m., Room C-116, Temporary Bldg. 5, Washington, D. C. Examiner Barron Fredricks.

Feb. 6—(Docket 946 et al.) Hearing in New York City Area Helicopter Service Case. 10 a. m., Assembly Room, Commerce and Industry Association, 9th Floor, Woolworth Building, 233 Broadway, New York, N. Y. Examiner Ferdinand D. Moran. Postponed from January 16.

Feb. 13—(Docket 4166) Hearing in CAB investigation of Summer Excursion Fares of Eastern Air Lines and National Airlines. Tentative. Examiner Herbert K. Bryan.

Feb. 20—(Docket 3966 et al.) Hearing in West Coast Airlines Certificate Renewal Case. Tentative. Postponed from February 13.

Feb. 20—(Docket 2724) Hearing in Colonial Airlines, Inc.—Final Mail Rate Case. Tentative. Examiner R. Vernon Radcliffe. Postponed from February 6.

Feb. 24—(Docket 4100) Hearing in Meteor Air Transport, Inc. Enforcement Proceeding. Tentative. Examiner Curtis C. Henderson. Postponed from January 24.

Feb. 27—(Docket 2755) Hearing in Pan American-Grace Airways, Inc. Mail Rate Case. Tentative. Examiner Barron Fredricks.

March 1—(Docket 3589 et al.) Oral argument before the Board in North Atlantic Route Transfer Case. 10 a. m., Room 5042, Commerce Building, Washington, D. C.

Aviation Calendar

Feb. 1-2—National Transportation Conference, sponsored by Chamber of Commerce of the United States, Chamber Building, Washington, D. C.

Feb. 6—Air Charter and Taxi Conference organizational meeting, U. S. Chamber of Commerce Bldg., Washington, D. C.

Feb. 9-10—Institute of Navigation symposium, Main Auditorium, Department of Commerce, Washington, D. C.

Feb. 16—Aviation Law Clinic, sponsored by the Chicago Bar Ass'n and Illinois State Bar Ass'n, 29 S. La Salle St., Chicago, Illinois.

Feb. 18-26—1950 New York Airplane Show in conjunction with National Sportsmen's and Vacation Show, Grand Central Palace, New York, N. Y.

Feb. 23-24—Aviation Education Conference, Hotel Traymore, Atlantic City, N. J.

Mar. 1-2—Louisiana Aviation Conference, Washington-Youree Hotel, Shreveport.

Mar. 6-8—CAA Fourth Region sixth annual Non-scheduled Operators' Meeting, Hotel Texas, Ft. Worth, Texas.

Mar. 6-8—Second annual National Agricultural Aviation Conference, Hotel Texas, Ft. Worth, Texas.

Mar. 6-9—American Road Builders' Ass'n annual meeting (including Airport Div.) Netherlands Plaza Hotel, Cincinnati, Ohio.

Mar. 24—Institute of the Aeronautical Sciences fifth annual Flight Propulsion Meeting, Carter Hotel, Cleveland, Ohio.

Mar. 30-31—Sixth annual Helicopter Forum (sponsored by American Helicopter Society and Institute of the Aeronautical Sciences), Ben Franklin Hotel, Philadelphia, Pa.

April 4-6—ATA annual Engineering and Maintenance Conference, Hotel Continental, Kansas City, Missouri.

April 10-14—American Society of Tool Engineers exposition, Convention Hall, Philadelphia, Pennsylvania.

April 16-20—American Association of Airport Executives annual meeting, Neil House Hotel, Columbus, Ohio.

April 17-19—SAE aeronautic meeting and aircraft engineering display, Hotel Statler, New York City.

April 24-26—Airport Operators Council third annual meeting, Hotel Carter, Cleveland, Ohio.

June 10-13—National Aeronautic Association 28th annual convention, Hotel Statler, St. Louis, Missouri.

International

Feb. 14—ICAO Meteorological Division meeting, Paris.

Mar. 21—ICAO African-Indian Ocean-Middle East Fixed Services meeting, Paris.

April 11—ICAO Caribbean regional meeting, Havana.

May 30—ICAO Fourth Assembly, Montreal.

May 30—ICAO Legal Committee meeting, Montreal.

Between the Lines:

Economy vs. Security

By James J. Haggerty, Jr.

"THE FACT that we have an awakened sense of responsibility as to the importance of preparedness in these troubled times has played an important part in stabilizing world affairs. But this preparedness must be economically sound. We in the Department of Defense are determined that our military power will not be built up so that it overburdens the national economy. But neither do we propose to be penny-pinchers with national security. Security must always come first and economy second."

The above was uttered by Defense Secretary Louis A. Johnson last week. There is not much issue that one can take with the words themselves—they are extremely sound. The question is whether the Defense Secretary believes them himself—and whether he practices what he preaches.

Taking it strictly from an aviation standpoint (and who but a diehard battleship admiral or an old-line infantryman will not admit that aviation is the front line of our national security) we are inclined to doubt that Mr. Johnson has placed security first.

Not that we are accusing him of any subversive effort to undermine our air defenses—far from it. But we feel that he is taking a calculated risk on the size of our air forces which we can ill afford. In exchange for this calculated risk he is effecting a rather dubious economy within the Department of Defense which may bring him or his political party the plaudits of the nation (and the votes that go with them) when next they are needed.

Intelligence Dropped One

Provided, of course, that the risk is well calculated. If it is not, there may never be another occasion for voting. Johnson's defenders will point out that he has the combined information of our several intelligence agencies from which to calculate the risk involved in operating air forces of reduced size.

But we can't help but recall that these intelligence agencies with their combined espionage resources were three years off in their predictions of when Russia would develop an atom bomb and might conceivably be just as much in error in their calculations of the chances of another war.

For the current fiscal year, 1950, which runs from July 1, 1949 to June 30, 1950, the Congress voted for a 58 group Air Force and provided money for the purchase of 2,550 planes; it also voted to let the Navy buy 843 planes.

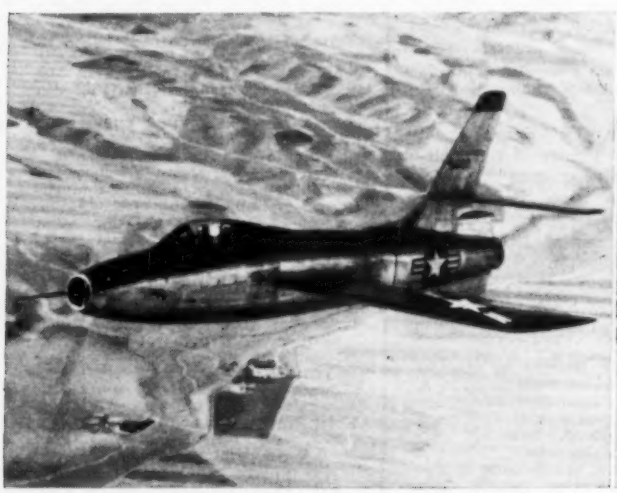
The Congress is composed of 591 representatives of the people. These representatives listened to reams of testimony from qualified witnesses as to what the services required, testimony which took several months to compile. They carefully estimated just what size defense appropriation the nation's economy would stand and then argued among themselves for weeks before finally clearing the appropriation bill.

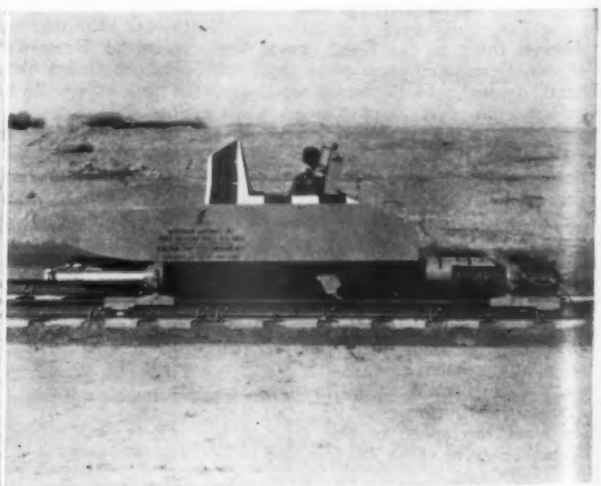
Held to 48 Groups

But then Johnson (through the President) withheld $850,000,000 of the money Congress had appropriated, and the Air Force, instead of operating 58 groups, was permitted to operate 48. Instead of buying the 2,550 planes it had been authorized by Congress to keep a modern Air Force in being, the Air Force was permitted to order only 1,250 planes. And the Navy got only 768 new airplanes instead of the Congress-approved 843 and was cut drastically in every phase of aviation.

By his cutback action, Johnson was, in effect, informing the Congress that he was more conversant with the problems of the national economy than were the Congressmen who voted on the military appropriations bill and that he would, in the future, decide the respective sizes of the military services, and they might as well not waste any more time holding hearings on the subject.

Now Johnson has submitted a budget for the coming fiscal year, 1951, which calls for Air Force and Navy air strengths close to the current year's strengths. Johnson's defenders point out that there is no further cut in military air power. That is true—but remember





Test Projects—Above are two currently active research projects undergoing test at Edwards Air Force Base, Muroc, Calif., the Air Force's desert test center. At the left is the radical Republic XF-91 interceptor fighter, which features a wing which can change its angle of attack in flight, thereby permitting a thin attack angle for high-speed flight and a high attack angle for take-offs and landings. The XF-91 also has an inverse-taper wing, that is, one which is wider at the tip than at the fuselage juncture. This reduces wing tip stalls experienced with conventionally tapered high-speed aircraft. At right is the ejection seat test carriage, developed for the Air Force by Northrop Aircraft, Inc. Powered by the rockets in the rear, it can move along the track at speeds up to 1,100 mph. Dummies are ejected from the seat at high speeds, to test the effect on a pilot forced to leave a disabled plane at supersonic speeds.

that the strength he is maintaining is the strength he himself established for the coming year, not the strength which a long-deliberating Congress deemed the minimum for adequate defense within the limitations of the national economy.

Security First?

We can't see that his budget restrictions have been consistent with the statement that "security must always come first and economy second." It appears, from our vantage point, that economy has been the prime consideration—an economy which will assuredly build a fine record to present to the voting public in 1952, when, it has been reported more than once, one Louis Johnson may be a candidate for the office of President. This fine economy record is being built only by taking a calculated risk with the nation's security.

We sincerely hope that he gets away with it, and that the risk has been well calculated. But we more profoundly hope that the Congress will take some action in this session to restore to itself the privilege of deciding our military strength. To parallel an old adage, 591 minds are better than one.

Supersonic Ejection

The peculiar looking object pictured on the opposite page is a plane which can do 1,100 miles per hour but which never leaves the ground. It is the Northrop ejection seat test carriage, designed to determine the effect on a pilot who is ejected from an airplane at supersonic speeds.

The 2,300-pound carriage, or sled, moves along a two-mile track which has been built for it at Edwards Air Force Base, Muroc, Calif., the Air Force's desert test center. It is propelled by rockets of 10,000 pounds thrust each, a maximum of 15 of which may be used, depending upon the test speed desired.

At about the one-mile mark on the track, when the desired velocity has been attained, the ejection seat in the sled catapults a 310-pound dummy into the air. All the forces acting upon the dummy are checked by movie camera and telemetering equipment, by which the Air Force hopes to find out whether the pilot could get free of a disabled plane at transonic and supersonic speeds.

The tests will decide whether the basic ejection system can be modified for use in tomorrow's high-speed airplanes, or whether AMC engineers have to get busy and design an entirely new system of pilot ejection.

How do they stop the sled after it discharges the dummy? Well, that's interesting too—it represents one of the first practical applications of reverse thrust. In front of the carriage, and at the bottom, there is a series of long rocket tubes. With the forward propelling rockets cut out, these front rockets are fired, developing a counteracting thrust which slows down the forward motion of the sled and brings it to a complete stop in a mile, or just about at the end of the track.

Production Spotlight

Healthy Backlog: Indications that the aircraft manufacturing industry is still in a very healthy state are contained in a joint survey report made by the Bureau of the Census and the Civil Aeronautics Administration. The report states that the **combined industry backlog** as of Sept. 30, 1949, was a whopping $2,859,000,000, approximately the same as it was a year earlier.

Of this total, 65% represented orders for complete airplanes and parts; $732,000,000, or 26%, was for engines and parts; $102,000,000, or 3%, for propellers and parts; and the remaining $173,000,000, 6%, for other products and services.

Net sales in the industry for the third quarter of 1949, the latest for which figures are available, amounted to $459,000,000, higher than any of the five previous quarters. New orders received during the same period totaled $437,000,000: $234,000,000 for aircraft, $170,000,000 for engines, $6,000,000 for propellers.

Another report, compiled by the Labor Department's Bureau of Employment Security, reveals that **employment** in the aircraft industry is in a gradual, though not serious, decline. The Bureau's statement, based on reports from 58 aircraft, engine and propeller plants, representing about 83% of the industry's work force, showed that total employment in the industry edged downward in November to 206,800 persons, from September's 215,600. The Bureau expects the decline to continue, to 204,400 this month and 203,100 next month.

Cargo Giant: *Bellanca Aircraft Corp., known in the industry as a lightplane manufacturer, has moved into the big plane field with a design proposal to the Air Force for a super-size cargo ship. One version of the design would have an empty weight of 175,000 pounds; the other would weigh 150,000 pounds empty. For size comparison, the giant Convair XC-99, cargo version of the B-36 bomber and currently the world's largest landplane, weighs only 132,822 pounds empty, and a new production model of the "99," still larger, would weigh only 152,000 pounds.*

Wing Design Suit: A patent infringement suit has been filed in Los Angeles district Court against **Consolidated Vultee Aircraft Corp.** and **American Airlines** by Maurice A. Garbell, former Convair employe. Garbell, of Maurice A. Garbell, Inc., consulting aeronautical engineers, and Garbell Research Foundation, charges that Convair used a wing configuration designed by him in production of the Convair-Liner, now in airline use by American and four other airlines. He claims he applied for a patent on the wing design in 1946 and received one in 1948. Shortly before he received it, he alleges, it was incorporated in the Convair-Liner.

Garbell seeks damages, unspecified as to amount but which his lawyers say will run "into the millions," and an injunction preventing further patent infringement, a technicality which could, if approved, ground all Convair equipment.

Convair officials, however, stated that they had carefully reviewed the Garbell charges and were "confident that a successful defense can be made."

AF Competition: *The Air Force's competition for a light observation-reconnaissance airplane, which will mean a healthy contract to the winner, has attracted 14 entries from light plane manufacturers. The competition, which ends April 1, is for a single-engine, tandem, two-seat, high-wing monoplane capable of carrying a 500-pound payload with a cruising speed as low as 43 knots required and 35 knots preferred. The competitors are Cessna Aircraft Corp., Helio Corp., Piper Aircraft Corp., Taylorcraft, Inc., Jamieson Aircraft Co., Emigh-Trojan Aircraft Co., Texas Engineering and Manufacturing Co., Aeronca Aircraft Corp., Aerobat Aviation Co., Fletcher Aircraft Corp., Aero Flight Aircraft Corp., Johnson Aircraft Corp., Boeing Airplane Co., and Luscombe Airplane Corp.*

Contracts: Convair has received an Air Force $1,350,011 contract for the installation of radar equipment in 36 T-29A (Convair-Liner) aircraft. . . . Republic Aviation Corp. was awarded a $127,327 Air Force contract for the design of an in-flight refuelling nozzle for its F-84 jet fighter. . . . Federal Aircraft Works, Minneapolis, Minn., will build ten wheel-ski installations for the Air Force's Northrop YC-125B assault transports under a $117,548 contract.

—J. J. H.

IN 1950 AMERICAN sets the pace

The largest and most modern fleet of transport aircraft in the world toda

In 1950—the fleet of the year is the Flagship Fleet! For American Airlines, and *only* American, can offer such a *vast* fleet of aircraft, such a completely *modern* fleet in every respect. And such a *versatile* fleet as well—for both the DC-6 and the Convair are designed for the type of route they ser

So whether you're traveling coast-to-coast, o a nearby city, make sure you go by air and- American Airlines Flagship. Then you will en air travel at its best on every trip.

...ac with the FLAGSHIP FLEET!

DC-6 FLAGSHIP

The acknowledged leader in trans-continental travel—first choice of passengers from coast to coast.

THE CONVAIR FLAGSHIP

Especially designed for inter-city travel—especially popular for its comfort and speed.

AMERICAN AIRLINES INC.

AMERICA'S LEADING AIRLINE

PEOPLE

ADMINISTRATIVE

G. K. Griffin has been elected vice president-personnel of American Airlines, a new position. Associated with American and a predecessor company since 1927, he rose through successive administrative positions to become assistant to the vice president-operations in 1936. He subsequently became assistant to the president, the post he held until his recent promotion.

Paul Frei has been promoted from staff assistant to the position of supervisor of overseas contracts and properties for Trans World Airline, replacing **James Vineyard**, who returned to the United States.

OPERATIONS-MAINTENANCE

John H. Stark, a 24-year veteran of the petroleum and aviation industries, has been named staff superintendent-petroleum products for United Air Lines. He joined UAL's traffic and sales division in 1946 after serving as Chicago district traffic and sales manager for Braniff Airways.

Michael J. Morse has been appointed division operations manager for National Airlines at Idlewild Airport, with jurisdiction over flight operations at Newark, Idlewild, Philadelphia, Baltimore, Washington, Richmond and Norfolk. A pilot since 1934, he joined NAL last year as a DC-6 captain.

Morse

Paul H. Sanders has been promoted from assistant system superintendent of line service and maintenance for Northwest Airlines to assistant system chief inspector. He replaces **H. B. Rosdahl**, who will assume other supervisory responsibilities in the airline's inspection section.

Walter G. Carson, former station manager for United Air Lines at Catalina Island, has been appointed station manager at Medford, Ore., replacing **Max Henne**, recently resigned.

Capt. H. W. Seagrim, formerly director of flight operations for Trans-Canada Air Lines, has been promoted to general manager-operations. His former post was taken by **Capt. J. L. Rood**. Also announced were the appointments of **Capt. R. M. Smith** as flight operations superintendent, Atlantic region, and **Capt. George Lothian** as chief pilot, Atlantic region.

Gerrard C. Reville, former acting chief transportation agent for Trans World Airline at Shannon, Ireland, has been appointed assistant district operations manager.

G. K. Griffin

Named V.P.-Personnel for AA

TRAFFIC & SALES

Frank Benson, former traffic manager for Trans World Airline in Pasadena, has been transferred to the international division as traffic chief in Bombay.

William Hottel, who has been head of TWA's traffic office in Mexico City, takes over the Pasadena post.

Marion Sadler has been promoted from New York reservations manager for American Airlines to the newly-created position of New York assistant district sales manager. **Ed Rhatigan**, former Washington reservations manager, has replaced Sadler, and **John Van Coevern**, formerly chief agent in charge of space control at Washington, succeeds Rhatigan.

Guildford C. Pearce

Aeroproducts General Sales Manager

Emmett J. Gearhart, from the New York office of Northwest Airlines, and **Charles L. Kirk, Jr.**, of the Pittsburgh office, have been transferred to Tokyo to assume positions as senior traffic representatives in that city.

MANUFACTURING

Guildford C. (Gad) Pearce, Washington representative for the Allison Division of General Motors Corp., has been appointed general sales manager of Aeroproducts Division of GM. He has been with Allison for 10 years, and before that was associated with several airlines operating out of Chicago.

Richard L. Johnson, assistant to the vice president-comptroller of the Douglas Aircraft Company from 1942 through 1948 and more recently with the Economic Cooperation Administration in Europe, has joined The Glenn L. Martin Company as assistant to the president. He specializes in business administration.

Johnson

Robert W. Kellhofer, for the past five years technical assistant to the chief of the Aircraft Section, Procurement Division, Air Materiel Command, has been named manager of the sales and service department of the Fairchild Aircraft Division, succeeding **Len J. Povey**, who becomes assistant director of customer relations of Fairchild Engine and Airplane Corporation.

Others in the News

Delman E. Rowe, former head of the electronics development divisions of the Naval Aviation Ordnance Test Station at Chincoteague, Va., has been appointed senior test director in the guided missiles research laboratory of the National Bureau of Standards.

H. M. Byrnes, formerly director of publications for American Airlines and American Overseas Airlines, has been appointed director of admissions of the Academy of Aeronautics, Inc., at La Guardia Airport.

Robert Kinkead, formerly export manager for the Fairchild Engine and Airplane Corporation, has been named as industrial specialist-aircraft on the staff of the U. S. member of the Military Production and Supply Board of the Atlantic Pact, with headquarters in London.

Kenneth E. Allen, director of public relations and advertising for Western Air Lines since 1946, resigned January 15 to accept appointment as deputy chief of information for the International Civil Aviation Organization.

IAS Awards Made At Honors Night

The highest honor of the Institute of the Aeronautical Sciences, that of Honorary Fellowship, was conferred on Arthur E. Raymond, vice president-engineering of Douglas Aircraft Co., and Dr. Jacob Ackeret, director, Institut Fuer Aerodynamik, Eidgenoessische Technische Hochschule, Zurich, Switzerland, at the 18th annual Honors Night Dinner in New York on January 23.

The John Jeffries Award for scientific endeavor in the field of medicine went to Dr. Arnold D. Tuttle, medical director of United Air Lines for "outstanding contributions to the advancement of aeronautics through medical research."

The Robert M. Losey Award was received by William Lewis, U. S. Weather Bureau meteorologist, for research work important to the design of ice-prevention equipment.

The Lawrence Sperry Award was won by Alexander H. Flax, head of the aerodynamic research department, Cornell Aeronautical Laboratory, for "significant additions to the methods available for determining dynamic behavior of airplanes, helicopters, and missiles."

The Sylvanus Albert Reed Award for notable contribution to aeronautics resulting from experimental or theoretical investigations went to George S. Schairer, staff engineer with Boeing Airplane Co.

Jerome Lederer, director of the Flight Safety Foundation, received a special IAS Council Certificate for his "outstanding contributions to safety in the air."

Darr Named President Of Monarch-Challenger

H. S. Darr has been named president and active head of the merged operations of Monarch Air Lines and Challenger Airlines. He has been president and principal stockholder of Monarch and not long ago acquired a controlling stock interest in Monarch with CAB approval.

C. A. Myrhe, treasurer of Monarch since its inception, becomes treasurer and administrative assistant to the president of the merged companies; Ray Wilson, former executive vice president of Monarch, becomes vice president-operations; and Donald A. Duff, who has been president and board chairman of Challenger, becomes vice president of traffic, sales and public relations.

Maj. F. W. Bonfils, chairman of Monarch's board of directors, retains his position and financial interest.

Senate Confirms O'Neill

The Senate has confirmed the nomination of Francis A. O'Neill, Jr., as a member of the National Mediation Board. O'Neill is the present chairman of the Board. His new term of office will expire February 1, 1953.

Airline Commentary

By ERIC BRAMLEY

YOU NEVER can tell when someone is going to pick up a suggestion and do something with it. In the issue of April 1, 1949, we expressed the thought that it would be a good idea for an airline to send a pilot out on a speaking tour to describe, in plain English, the navigational aids the airlines have, and how they help safety and dependability. In December came a letter from New Zealand National Airways Corp., of Wellington, N. Z., some 9,500 miles from here. Writes the public relations officer: "This airline adopted your suggestion and a senior pilot and the writer made a two months' tour of New Zealand addressing chambers of commerce, manufacturers' associations, travel clubs, schools, etc., at the majority of points of any size in the Dominion. . . . It is wished to acknowledge the source which promoted this sales plan, and it is hoped to give you the satisfaction of knowing that your recommendation was a sound one." The NZNAC program included four films: the conversion course of Air Force pilots to civil qualifications and the modification of war-time DC-3's to standards of modern passenger comfort, the duties of a junior pilot, air cargo development in the postwar period, and an aerial travelogue of the company's routes. The pilot then spoke on navigational aids, flight plans, instrument let-down procedures, etc., the pubrel officer on administrative and traffic subjects, and there was a final period for questions and discussion. "The agenda, delivered during October and November, and preceded by a three-month intensive general advertising campaign, was exceptionally well received at every meeting," he writes. "The traffic revenue figures for the two months ending mid-September were 20,000 pounds ($56,000) down on the corresponding period of the preceding year. For the month ended Oct. 15, 1949, there was an overall traffic increase in revenue of 3% and in the subsequent month, passage money increased 15.83%, freight 28.9% and charter flights 496.4% on the comparative period in the preceding year. This last month presented a revenue increase of 12,333 pounds ($34,532)." Sounds like the NZNAC program might have had something to do with the increase. We still like the idea.

•

Pretty snappy looking insignia in the accompanying picture, isn't it? Sorta looks like Eastern Lines using some kind of an Indian head in the background. But to let you in on a little secret, it's really the insignia on one of the DC-3's operated by Ethiopian Airlines, a company which, incidentally, is doing a pretty fair job (and currently showing a profit). TWA has a management contract with EAL (but owns no stock) and W. G. "Swede" Golien, known to many of you, is general manager.

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Little bits from here and there: Next time you see **Ken Fletcher,** TWA's public relations manager in San Francisco, ask him to count his fingers (Ken went on an overseas familiarization trip recently and had a little trouble with Immigration about an erroneous notation on his passport that he had had two fingers amputated from each hand) . . . **Ralph Heininger's** friends will be interested to know that he's with the James Owen Nursery in Bloomington, Ill. Ralph was in the airline business a long time—used to be Chicago & Southern's general traffic manager . . . Congratulations to **"Cap" Miller,** Capital's district sales manager in Cleveland, on his election as president of the Cleveland Passenger Club. Quite a distinction for an airline man in a club loaded with railroad officials . . . **Bob Henry,** agency and interline manager of Scandinavian Airlines System, Inc., sends us a traffic and sales circular being distributed among SAS European personnel. It's the humorous definition of a "full-fare passenger," authored by **Stan Osborne,** vice president of Eastern Air Lines, during the Mexico City IATA meeting. It appeared in this column Jan. 1. . . . Thanks to **George Scott,** Northeast Airlines' general sales manager, for sending us a copy of "Song of the Yankee Fleet." It's NEA's singing commercial, and George says it's showing promise of becoming a hit tune . . . A bouquet to **Jennings Randolph,** assistant to the president of Capital, who made 168 speeches (count 'em) during 1949, which should qualify him as one of aviation's best salesmen.

The end is only the

As these words are written, the twin-jet Cutlass, Vought fighter airplane, is nearing the end of a long hard trail of research, design, development and test.

For 32 years Vought has built conventional airplanes of proved design for the U. S. Navy. The Cutlass, however, was completely new — a radical departure from Vought's time-tested fighter aircraft. It has no tail and it does have swept-back wings, two logical developments which posed problems Vought engineers never before had faced.

The Cutlass is Vought's first twin-engine jet fighter. To save weight, the engineers incorporated more magnesium in its airframe than in any previous Vought design, and made extensive use of Vought's lightweight "sandwich" materials. To overcome the forces of high speed flight, they provided hydraulic-boosted ailevators (combining elevator and aileron functions) and incorporated artificial "feel" to simulate the control forces the pilot would encounter in conventional aircraft. And, finally, they created an airplane that would have

The Vought F7U-1 Cutlass twin-jet fighter, latest and fastest in a long line of Vought airplanes that have played well their part in maintaining American air supremacy.

hbeginning

superior speed and performance at high altitude, yet handle effectively at low altitude for carrier landings.

These experiments and many others in this advanced aircraft design offered a lot of challenges. But, they are about ready to pay off — because the Cutlass, which in 1945 was only a gleam in a designer's eye, is emerging as one of the nation's top fighters.

It is fast — as fast as they come. Its rate of climb is meeting and exceeding performance requirements. It is highly maneuverable even at speeds in the neighborhood of the speed of sound. It has the firepower to deliver a telling blow in combat. It is equipped with the finest and most modern in radio, navigational aids, pressurization, instruments, hydraulic controls and other cockpit equipment. Flight-wise, the Cutlass has proved to be a pilot's dream.

Now, it is ready to start down another long trail: production, refinement and actual service in defense of the nation.

Yes, the end is only the beginning.

OUGHT AIRCRAFT

DALLAS, TEXAS

One of the four divisions of
UNITED AIRCRAFT CORPORATION

SPEED

Top speed of the Cutlass is a military secret. But here's a hint — it's in the "over 650 m.p.h. class". And, it's not a one-altitude fighter. At four hundred feet or at forty thousand, it will compete with anything in the air.

MANEUVERABILITY

The Cutlass can execute any aerobatic maneuver like a scared jack-rabbit. At one mile up, or eight, it can overtake any existing bomber or fighter — and turn inside it.

RUGGEDNESS

Structural stamina has been built into this newest Vought fighter. Severe and rugged tests have been imposed on it and it is already evident that the Cutlass is endowed with traditional Vought ruggedness. The Cutlass can give it — and "take it".

120 Landings Per Hour:

New Omni Range Design Gives Greater Approach Accuracy

By WILLIAM D. PERREAULT

Speaking before The Institute of the Aeronautical Sciences last week, two engineers of the Sperry Gyroscope Co. revealed the existence of a new omni-directional radio range system for use in the terminal area. The engineers, J. Lyman and G. B. Litchford, indicated that potential accuracies available with such a system will permit airports to handle up to 120 landings per hour.

Sperry's precision omni-directional radio range was developed for the military services and is now being sponsored by the USAF through the All Weather Flying Division and Watson Laboratories. Experience with a pilot installation at Sperry's Flight Research Center at MacArthur Field, Long Island, has demonstrated accuracies in the order of plus or minus one-half a degree. This compares with the 2-degree tolerance of omni systems now being installed for general navigation purposes.

Schedules on Increase

As the frequency of aircraft schedules increase and the operating minimums in bad weather are lowered, it becomes increasingly obvious that the airport is the bottleneck. Peak operations into key airports may now exceed 30 landings and 30 take-offs per hour. ATA recently estimated that peak hour demands will increase as much as 65% by 1956.

Studies have shown that any attempt to operate schedules into an airport at a frequency approaching the maximum capacity of the airport results in large delays to all aircraft involved. In their paper before the Royal Aeronautical Society, E. G. Bowen and T. Percey show that schedules of 80% or more of maximum airport capacity are critical.

Using this as a basis, the Sperry engineers approach the problem of determining the operational requirements of a terminal area aid and then establishing how these requirements might best be met. Using 120-mph approach speed as typical of present-day large aircraft, Lyman and Litchford designed their operations around an airport with a maximum capacity of 120 landings per hour. This provided a relationship of one landing every 30 seconds and 1 mile spacing between aircraft. Operationally such a system would be used at 85-90 aircraft landings per hour.

Basic Criteria

As is apparent, this is tight scheduling as judged by today's standards. To accomplish it, the engineers point out, the following basic criteria must be established. (1) the position of the aircraft along its track, and to the left or right of the track, must be known within plus or minus 250 feet, or within a 500-square-foot area. This represents the positional accuracy of the system.

(2) Spacing of aircraft at 30 second intervals must be accurate to within plus or minus 3 seconds at the entry gate (3) to keep bracketing to a minimum heading accuracy of plus or minus 5 degrees is required at the entry gate (4) approached speed must be accurate to within plus or minus 2%, or in this case 2.4 mph based on 120 mph approach speed, and (5) the control zone radius must be approximately 30 miles.

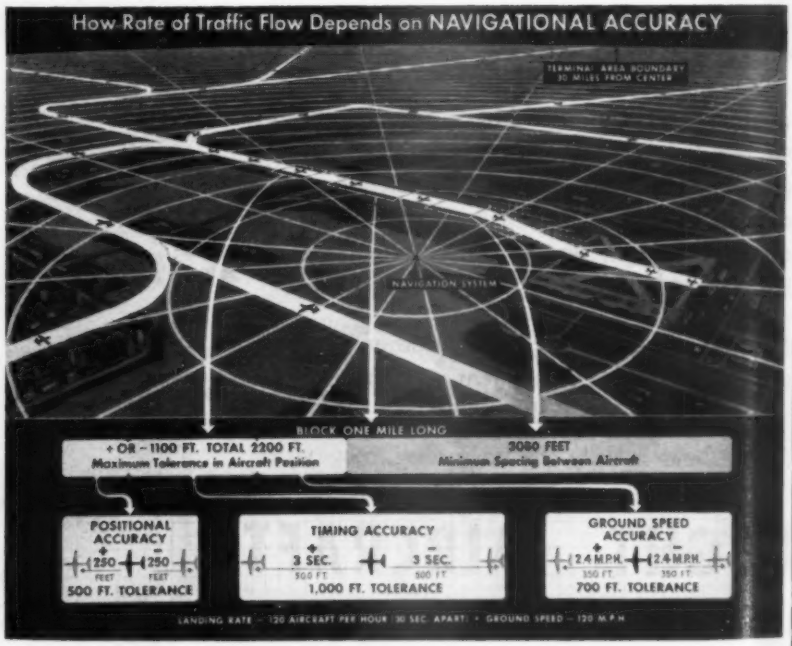
Positional accuracy, the position of the aircraft relative to a ground coordinate system, is the most critical factor in assuring safe, high frequency scheduling, the authors indicate. In the case of the airport described above, basic inaccuracies can result in reducing the separation of the aircraft from 1 mile (5,280 feet) to approximately 3,000 feet. This leaves a safety factor of 2.5 to 1.

These variables which bring about this lessening of theoretical separation and consequent reduction in safety factors are shown in the accompanying illustration.

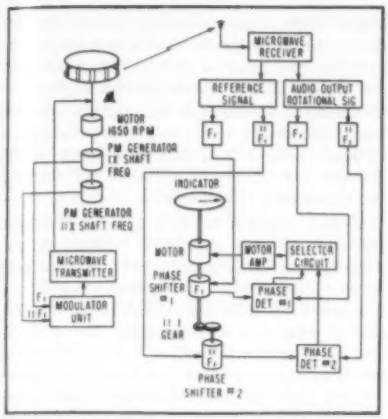
Adding the Errors

An entry gate is established at the start of the final approach to serve as a reference to measure traffic flow into the landing pattern. Since aircraft can be positioned anywhere within this 500 sq.-foot area, criteria (1), the aircraft might be 250 feet away from the central position. The three-second tolerance on spacing of aircraft represents approximately 500 feet at the approach speed of 120 mph. Positional error plus spacing tolerance brings 750-foot potential variation.

Another 2% tolerance in approach speeds represents about 350 feet additional potential error in position or a total of plus or minus 1,100 feet. Considering the relationship of two aircraft, this reduces the optimum separation of 5,280 feet to approximately 3,000 feet and safety factor to 2.5 to 1. Improved safety is dependent on lower landing rates, higher positional accuracy, increased scheduling accuracy or improve-


How Rate of Traffic Flow Depends on NAVIGATIONAL ACCURACY
TERMINAL AREA BOUNDARY 30 MILES FROM CENTER
NAVIGATION SYSTEM
BLOCK ONE MILE LONG
+ OR – 1100 FT. TOTAL 2200 FT.
Maximum Tolerance in Aircraft Position
3080 FEET
Minimum Spacing Between Aircraft
POSITIONAL ACCURACY
+ 250 FEET – 250 FEET
500 FT. TOLERANCE
TIMING ACCURACY
+ 3 SEC. – 3 SEC.
500 FT. 500 FT.
1,000 FT. TOLERANCE
GROUND SPEED ACCURACY
+ 2.4 MPH – 2.4 MPH
350 FT. 350 FT.
700 FT. TOLERANCE
LANDING RATE – 120 AIRCRAFT PER HOUR (30 SEC. APART) • GROUND SPEED – 120 M.P.H.

ACTUALLY the safety factor accompanying a given frequency of aircraft landings per hour at an airport is closely related to navigational accuracy. This system is based on 120 landings per hour or one every 30 seconds. The planes are assumed to have a ground speed of 120 mph and would thus be one mile apart at all times. Actually, as shown in the photo, tolerances which must be provided makes it possible for the aircraft to be as close as 3,000 feet from one another. In a system of this type, designed to handle 120 aircraft per hour, delays become large if more than 85 landings per hour are scheduled.



BLOCK DRAWING shows both the ground station equipment used with Sperry's precision terminal area omni-directional range (on left) and the airborne equipment.

ments in ground speed measurement accuracy.

Lyman and Litchford indicate that several methods of measuring distance to within plus or minus 250 feet accuracy have been proved but lack of accuracy in measuring azimuth is "one of the main difficulties in the use of such a system." To achieve 250-foot positional accuracy at 30 miles the azimuth must be measured to approximately plus or minus 0.1 degree. Accuracies of plus or minus ½ degree have been demonstrated with Sperry's new range system and it "appears . . capable of higher degrees of accuracy."

The Sperry Solution

In the basic omni-directional range system azimuth angle of the aircraft from the range station is determined by measuring the phase angle between two signals originating in the range station. One of these signals is a constant reference phase while the other, emitted by a rotating antenna, varies in phase in direct relationship to the azimuth position of the antenna.

The basic relationship here is: one degree of azimuth equals one degree of phase shift. This means that the accuracy obtainable in determining aircraft position is directly related to the ability of equipment available in the aircraft to measure this phase angle. This is what Sperry engineers have achieved. They have designed a mechanism for producing 180 degrees phase shift for each 16 degrees (approximate) change in azimuth. The result is an increase in accuracy of azimuth angle measurement by a factor of 11.

This is achieved by using an antenna pattern having 11 lobes per complete rotation. This produces 11 sine wave cycles in the same period. The one obvious shortcoming of this arrangement is that there will be 11 points of ambiguity in the individual cycles. This is overcome by superimposing the 11 lobe pattern on the existing single limacon pattern to give a complex space modulation. Another high frequency reference signal is added for reference with the multi-lobe rotational signal thus providing an unambiguous measurement of azimuth angle.

System Operation

In the actual installation the antenna is rotated at 1650 rmp so that the sine wave frequency of the limacon pattern is 27.5 cycles per second and that of the multi-lobe pattern is 302.5 cps. These signals are provided by generators, as shown in the block diagram, and impressed on a microwave carrier. Four signals received in the aircraft are separated in the receiver with the rotational signals fed to the phase detectors and the reference signals fed through two phase shifters to the phase detectors.

Output of the phase detector, when two signals of the same frequency are impressed on it, is a d-c voltage having amplitude and polarity dependent upon the relative phase between the rotational and reference signals. The output of one of the parallel connected phase detectors is applied to the motor connected to the phase shifters. The phase shifter shifts the phase of the signal being passed through it in direct proportion to the relative angular position between its rotor and stator. The motor drives the phase shifters until the phases of the rotational and reference signals match and the output is reduced to zero. The indicator is geared to the motor phase shifter shaft translating the electrical phase measurement to azimuth angle measurement.

When the indicator is placed in operation, the coarse signal (#1) controls the motor and indicator positioning the unit roughly. Then the relay in the amplifier switches over and the fine signal takes over. This is basically the system through which ambiguities are prevented since the coarse signal brings the indicator and related circuit into a range where only one of the 11 minor sine waves will be effective.

The antenna which is used in this system consists of a triple dipole element which produces the limacon radiation pattern within the confines of a specially designed waveguide. This consists of two ten-inch metal discs separated by 11 equally-spaced staves, dielectric r-f phase shifters. The shape of the multi-lobe pattern is controlled by the spacing and dimensions of the staves.

To minimize possibility of reflected signals, a cylindrical lighthouse lens is used around the antenna. This design eliminates many of the reflection problems and tends to focus signals through control of the distribution patterns.

Among the Suppliers

The **Dow Chemical Co.**, Midland, Mich., has been developing an improved magnesium extrusion alloy (ZK60) containing 6% zinc and six-tenths of 1% zirconium, which has shown increased toughness, relative insensitivity to notch effect, and good impact toughness and fatigue strength. One outstanding application is the use of ZK60 for the floor beams in the Douglas DC-6 . . . **Wright Aeronautical Corp.**, Wood-Ridge, N. J., has sold 508 Cyclone 18BD engines for installation in models 649 and 749 Lockheed Constellations. The total number of engines for these planes, including spares sold directly to the airlines, is 849 and current orders will keep this type engine on the assembly lines until at least August, 1950.

The Prevost F. Smith Parachute Co., Santee, Calif., has announced a contract with **Ryan Aeronautical Co.** to supply the parachute recovery systems for its target plane XQ-2. The company is also offering a 1,000 mph parachute for missiles . . . **Victor Chemical Co.**, Los Angeles, has signed a contract with **Pacific Airmotive Corp.** under which the latter will have exclusive worldwide distributorship for all airlines of Victor Brand Products . . . **The Weber Aircraft Div.** of Weber Showcase & Fixture Co., 2001 Belgrave Ave., Huntington Park, Calif., has supplied pilot and crew seats for **Convair's** XP5Y-1 . . . **Douglas Aircraft Co.** has opened a parts sales office at 247 Park Avenue, New York, to expand parts sales and service representation to airlines on the Atlantic coast. **David Downey** will head the office.

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System Here To Stay:

AA Rates Thermal De-Icing Protection Over Added Cost

To date thermal de-icing systems have proved more costly than earlier systems but are providing greater protection, and the costs will be reduced as operating experience is accumulated. That's the conclusion of two American Airlines engineers reporting on AA's post war experience in this field.

In a paper presented at the annual SAE meeting in Chicago last month, M. G. Beard, director of flight engineering, and Dave North, assistant project engineer with American, outlined the operational experience, maintenance problems and cost of thermal de-icing systems for wings, empennage, windshields and propellers. The results were both revealing and promising.

American's entire fleet of 125 passenger aircraft use thermal de-icing in lieu of earlier systems. Their 50 Douglas DC-6's use three combustion type heaters for the wing surfaces and the 75 Convair Liners are equipped with two heat exchangers in each of the engine exhaust systems. In both airplanes air is delivered to the leading edge of the wing at a temperature which keeps the wing leading edge at between 30 and 100 degrees fahrenheit. The skin is not hot, it is merely warm.

Anti-Icing vs. De-Icing

American's experience has shown that it is generally advisable to apply the heat to the wing before encountering anticipated icing conditions rather than waiting for ice to form and then attempting to melt it off. The manufacturers recommendations to this effect have been verified in the Convair operation by polls of pilot personnel that showed a preference for use of the systems as an anti-icing rather than de-icing function. Of 85 pilots filing returns, 33 felt they had insufficient experience to judge, 35 preferred the anti-icing function and 12 favored de-icing. Five pilots qualified their answers according to specific icing conditions.

Beard and North cited design improvements which they felt advisable for future installations to insure better de-icing of the wing and stabilizer tips, wing centersection, nose and possibly antennae. Ice accumulation in the wing center section of the DC-6 is visible to the passengers and can raise the pre-stall buffeting speed.

Aerodynamic Losses

On the Convair Liner chordwise rivulets sometimes form well back of the wing tanks near the wing trailing edge and on the underside of the wing in amounts which made it possible for the crew to see the formation from in the cockpit. Some of this icing is attributed to runback.

Runback can occur in both the DC-6 and Convair "when the accretion rate exceeds the ability of the wing to evaporate" moisture. On the Convair, ice sometimes forms a substantial ridge in the region of the front spar. Runback can cause stabilizer buffeting. Increased drag accompanying icing reduces single-engine performance. American has warned its Convair crews that a loss of 40 mph in airspeed, below normal levels, should be cause for evasive action. Experience has shown that ice formed by runback can always be dissipated after leaving the icing area and prior to landing.

Earlier fears that unequal de-icing of the wings might cause lateral trim problems have not materialized. Changes in trim accompanying such a condition occur gradually enough to permit simple corrective measures.

Wing and tail de-icing of the DC-6 has cost about $1.00 per hour of airplane time or $16.60 per hour of actual use in flight This is considerably below the $4 per airplane hour for the Convair Liner and $80 per hour of actual flight use for the latter. Major cause of the high cost of Convair de-icing is the design of the heat exhanger or augmentor tubes. Fatigue cracks and other failures limit service life of these units to 400 hours, AA's engineers indicated.

Future success of this system "hinges directly on the ability of designers to develop an augmentor heat exchanger tube which will withstand the high temperatures and the punishment of pulsating engine exhaust gases for a full engine overhaul period." New designs for this unit now in process may raise service life to 1,000 hours almost immediately and eventually to 2,000 hours. This could cut hourly airplane costs from $4 to somewhere between $1 and $1.50, these engineers predicted.

Message to Garcia—To simplify the problem of getting last-minute messages to the crew after the ramp has been drawn away, Western Air Lines is using the gadget shown here. The rubber hose on the end of this stick provides a simple pocket in which to place weight manifests or other slips of paper. Demonstrating the gadget is Stewardess Julie Miller and First Officer Bob Knowles.

Propeller De-Icing

American's experience with electrical propeller de-icing has been interesting. While both the DC-6 and Convair propeller de-icing systems are very much alike, costs vary widely on the two planes. The DC-6 de-icer shoes have an average service life of 1,000 hours. This airplane averages one landing per 120 minutes and in general service good airports. This brings propeller de-icing cost per airplane hour to 70c and cost per hour of de-icing flight to $12.

On the Convair Liner, which makes a landing every 50 minutes and serves smaller airports with poorer facilities, service life of the propeller boots is 400 hours. This is in part due to the 11-inch propeller clearance on the Convair as compared to 26 inches for the DC-6. This combination of factors result in a cost of 88c per airplane hours for the twin-engine Convair and a cost per hour of de-icing flight of $18.

Maintenance problems with the electrical propeller de-icing have been reduced. Protective relays, to prevent unsymmetrical de-icing, gave trouble and were removed. Ammeters are now provided in the cockpit to monitor proper operation. Stranded resistance wire was substituted in the boots to minimize fatigue breaking and resultant troubles which had raised maintenance problems. To further minimize boot replacement problems on the Convair, American is "pursuing the development" of a two-piece prop shoe which has a 15-inch segment of extra heavy leading edge boot to withstand severe abrasion and provide easy replacement.

New and Outstanding

American is particularly enthusiastic about the results obtained with the Nesa glass in the Convair windshields. Beard and North refer to the system as "new and outstanding." Advantages of Nesa-type de-icing are cited as: uniformity of heat application, absence of fogging or dirt collection characteristics of double

panes, constant heat output available at all times and elimination of the double light image at night.

American has found Nesa glass to be "a complete success" from a de-icing standpoint. While citing that the de-icing benefits of electrically-heated glass as so great that its development cannot stop, American's operating costs have been high for this system. Cracking under thermal stresses, disintegration of the Nesa film and overheating resulted in 100 main or direct vision windows being changed in a 12-month period.

This averaged one failure per every 1,500 airplane hours. Realizing that the cost of replacing a main window represents $550 and that of a direct vision panel $225, the relatively high hourly costs are understandable. Cost for Convair windshield de-icing per airplane hour ran 35c compared to 10c for the DC-6 windshield de-icing. It is interesting to note that $175 of the $550 charge represented labor cost as did $75 of the $225 item. Beard and North urged that designers work toward easily-removable installations.

Problems Remain

Icing problems still exist in the scoops supplying air for the heaters, superchargers and other services, and ice accumulation on antennae, the airplane nose and similar spots still cause difficulties. The engineers stressed the importance of improved antenna protection because of the increasingly important part played by communications equipment in scheduled winter operations. They suggested that more rapid progress on burying antennae in the aircraft structure might solve this problem.

Proposal Would Extend Navigation Light Coverage

A proposed regulation now being circulated by CAB for industry comment would require that all aircraft over 12,500-pounds gross weight be equipped with two-circuit flashing navigation lights. This is the same provision now required of scheduled air carriers.

It consists of a red light on the left wing, a green light on the right wing and a white light on the tail. These lights flash alternately with single white lights on the top and bottom of the fuselage and a red light on the tail. Technical Standard Order C18 establishes the mechanical requirements of flasher mechanisms for this type circuit.

CAB indicates that another TSO will be issued shortly covering flashers for personal aircraft using a single circuit, three light system.

Military aircraft would be affected by the proposed ruling and CAB states that the services are currently equipping their aircraft to this standard. Foreign operators into this country would be required to meet this requirement or parallel ICAO provisions.

Technical News Digest

• **Final testing of the Stratocruiser** by Boeing and PAA in order to increase the gross take-off weight from 142,500 pounds to 148,000 pounds has been shifted from Seattle to San Diego. The plane being used is the last Stratocruiser delivered to PAA. Higher gross weight is with Hamilton Standard propellers and is the same weight used for the military C-97A Strato-freighter.

• **The British jet transport,** the 490 mph de Havilland Comet, encountered its first severe gust condition recently, a gust estimated at 4G. Airplane was flying at 35,000 feet altitude against 190 mph headwind. The short duration of gusts encountered at high speeds minimizes their affect. While not ready to dismiss the question of gusts, de Havilland is hopeful that no serious problem exists on the basis of the 150 hours of Comet testing to date.

• **Two new commercial speed records** were claimed during January. Western Air Lines made a 96 minute flight from Portland to Oakland, at 19,000 feet altitude in a Convair Liner, averaging 360 mph and with a top speed of 450 mph. Flight beat schedule time by 59 minutes . . . Northwest claims a new record on the Minneapolis-New York route, 1,055 miles, which it made in two hours and 38 minutes with the Boeing Stratocruiser. Averaging 400 mph, the NWA ship cut four minutes off the previous record.

• **Aircraft Maintenance International, Inc.** has disclosed negotiations with the Port of New York Authority for the erection of a permanent hangar at New York International Airport. AMI is now working in space granted on a temporary basis.

• **The compliance date** for the CAB regulation which would require intrastate operators (with specifically defined regularity of operations) to establish maintenance, communication and other facilities outlined in CAR Part 61 has been extended. Originally scheduled for enforcement on January 1, the date has been moved to April 1 and its application restricted to those operating aircraft weighing 12,500 pounds or more.

• **"The Federal Government and Navigation"** is the subject of a two day symposium sponsored by the Institute of Navigation scheduled for February 9-10. Many top military and civil aviation leaders will be on the program which is being held in the Commerce Auditorium in Washington, D. C. Among them are: the Secretaries of the Army, Navy and Air Force; CAA Administrator Del Rentzel; CAB Chairman J. J. O'Connell; Maj. Gen. Laurence Kuter; RTCA's Dr. J. H. Dellinger and many others.

• **CAA's steps toward familiarization** of personnel with jet aircraft design and operational problems were outlined by Civil Aeronautics Administrator D. W. Rentzel in discussing the role of the federal government in civil aviation before the Air Transportation Institute of the American University. He said, "We have been in continual touch with a Canadian factory which has a jet transport flying (the Avro C-102) and which probably will present it to use soon for certification."

• **James H. "Dutch" Kindelberger,** chairman of the board and chief executive officer of North American Aviation has been elected 1950 president of the Institute of the Aeronautical Sciences, succeeding William A. Burden. New vice presidents include Wellwood E. Beall, Boeing Airplane Co.; William K. Ebel, Canadair Ltd., William Littlewood, American Airlines; and E. G. Stout, Convair. Elmer Sperry, Jr. of Sperry Products, Inc. was elected treasurer.

• **Qualified college graduate** with engineering or scientific undergraduate work are being sought for the six $2,000 Daniel and Florence Guggenheim Jet Propulsion Fellowships. Three of the Fellowships are for two years postgraduate study at Princeton University and three at California Institute of Technology at the Jet Propulsion Centers. Fellowships begin in the fall of 1950.

• **Dr. Irving Langmuir,** vice-president and director of research with General Electric, has retired. During his 40 years with GE, Langmuir established a world reputation as a scientist. He is noted particularly for his work in development of the gas-filled incandescent lamp, high vacuum power tube, atomic hydrogen welding, and methods of artificial production of snow and rain from clouds.

Extra Section

By William D. Perreault

HAVING reported the work of the RTCA during the past two years, we were particularly pleased to be on hand at the White House when Dr. J. Howard Dellinger, chairman of the RTCA, accepted the Collier Trophy from President Harry S. Truman on behalf of his organization. This was our first "official" visit (without paying for the 25c tour) to the White House and was coupled with another surprise. Fellow staff member Barbara Ward and I got to shake hands with H.S.T. and later had our pictures taken in a group with the President and other notables including CAA Administrator Del Rentzel, Under Secretary of the Navy Dan Kimball, CAB Chairman Joseph J. O'Connell, NACA Secretary John Victory, ALPA President Dave Behncke, AOPA's J. B. Hartranft, UAL's Communications Director Russ Cunningham and others.

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Remember Bill Stout? He was the designer of the famous Ford Trimotor. He also designed the scarab streamlined automobile many years before the time of fender-less autos, a streamlined train, etc. His contributions to aviation are long and memorable. And he is also a master at the art of telling a funny story. While in Phoenix, Ariz., recently on a TWA "Quickie Vacation" to the Valley of the Sun, we spent considerable time with Stout. He was one of the "unofficial hosts" who contributed so much to our trip. Bill now has a miniature flying model of an ornithopter, the gadget that flaps its wings like a bird to attain flight. He's sure that the potential utility of such a vehicle will ultimately give it a place in the sun. If it can be done, Stout is the one to do it.

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Next time we write a story about cleaning airplanes we'll first take out more insurance. Our recent yarn on American Airlines' airplane cleaning really started something. We've had letters from virtually everyone associated with airplanes and cleaning. Turco noted that AA is using Turco emulsion cleaners at some system points. The Penetone Co. of Tenafly, N. J., noted that we did not adequately identify its carbon remover, Navee 427. NWA wrote that officially they are not thinking of changing to AA's system. And there were others, too.

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News note: LOCKHEED BUYS DOUGLAS! But it's an airplane, not the company. Lockheed is being ribbed in Los Angeles for buying a Douglas DC-3 to use as a company plane plying back and forth between Burbank and Muroc. A Lockheed Lodestar isn't big enough because usually up to 21 company people are flying at a time. Lockheed simply got tired of paying high charter rates which involved a lot of deadheading so it ups and buys the DC-3 which fills the bill perfectly. Seems that factory employes can't be domiciled at Muroc which requires a lot of commuting.

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According to newspaper clippings from Paris, the council of French commercial pilots is demanding that two pilots be assigned to Douglas DC-4 airplanes. It seems that since last June Air France has only been using one pilot on medium-range flights and the pilots feel that this is difficult during landing operations.

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We often refer to activities of the Flight Safety Foundation because we feel it is a worthwhile organization performing a much-needed industry service. The FSF's experience interchange bulletins dispense useful information along with recommendations well worth remembering. We enjoyed Jerry Lederer's recent reference to scientists objecting to deciding technical matters by counting noses when intelligent evaluation is possible. "They claim, 'No progress is made by taking a statistical appraisal of the current level of ignorance."

TECHNICAL LITERATURE

Rivet Manual: The South Chester Corp., Finance Bldg., Philadelphia 2, Pa., has published a new 28-page manual describing their full range of Southco Blind Rivets, anchor nuts, panel fasteners, door-retaining springs, etc. Full descriptive and engineering data on this complete line of metal-to-metal, metal-to-plywood and other combination fasteners is provided.

Micropositioners: Barber-Colman Co., Rockford, Ill., is circulating a brochure on the Barber-Colman Micropositioner, a polarized relay. Bulletin F-3961 describes the various types of micropositioners as well as several common aircraft applications.

Metal Defects: Sperry Products, Inc., Danbury, Conn., has published Bulletin 50-105, a four-page pamphlet describing "The Reflectoscope," an ultrasonic instrument for instantaneously locating defects in metals and other materials by application of a single "searching unit." Inquiries should be addressed to E. B. Lang, advertising manager.

Pyrometer Catalog: The Pyrometer Instrument Co., Inc., Bergenfield, N. J., has published Catalog No. 180 illustrating and describing the new Pyro Surface Pyrometer, a self-contained, portable instrument suited for industrial surface and sub-surface temperature measurements.

Daily Plane Utilization

International

			Sept.	Oct.
AA	4 eng. pass.	...	5:55	5:47
AOA	2 eng. pass.	...	1:46	1:48
	4 eng. pass.	...	6:00	5:07
Braniff	2 eng. pass.	...	4:35	....
	4 eng. pass.	...	7:04	6:10
C & S	4 eng. pass.	...	8:53	9:01
Col.	4 eng. pass.	...	4:11	4:40
EAL	4 eng. pass.	...	9:18	9:13
NAL	4 eng. pass.	...	6:27	6:40
	cargo	...	:25	:29
NWA	4 eng. pass.	...	10:13	10:04
Panagra	2 eng. pass.	...	3:44	4:07
	4 eng. pass.	...	6:41	6:21
	cargo	...	:58	1:23
PAA				
Lat. Am.	2 eng. pass.	...	3:15	3:07
	2 eng. pass.	...	8:35	7:22
	cargo	...	1:58	2:32
Atlantic	2 eng. pass.	...	:19	....
	4 eng. pass.	...	6:25	5:25
	cargo	...	8:00	8:25
Pacific	4 eng. pass.	...	7:54	6:51
	cargo	...	11:46	11:44
Alaska	4 eng. pass.	...	8:21	7:50
	cargo	...	7:08	5:25
TWA	4 eng. pass.	...	9:22	8:50
	cargo	...	4:15	5:34
UAL	4 eng. pass.	...	6:21	6:00

Feederlines

		Sept.	Oct.
AAA	DC-3	6:05	5:58
Central*	Beech A-35	1:00	2:02
Challenger	DC-3	7:32	7:01
Empire	DC-3	5:00	5:00
Mid-West†	Cessna 190	....	2:54
Monarch	DC-3	7:18	7:09
Piedmont	DC-3	7:33	7:47
Pioneer	DC-3	7:16	6:49
Robinson	DC-3	5:35	5:41
Southern	DC-3	6:24	7:23
Southwest	DC-3	5:49	5:29
TTA	DC-3	7:10	7:38
West Coast	DC-3	4:56	3:49
Wigginst	Cessna T-50	1:55	2:17
Wis. Cent.	Lockheed 10A	6:51	7:10

* Began operations Sept. 15, 1949.
† Began operations Oct. 21, 1949.
‡ Began operations Sept. 19, 1949.

NEW PRODUCTS

Tampatch

United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio, has introduced Tampatch, a new product for high-speed repair of concrete floors. Tampatch is sold in ready-mixed form, ready for use. It permits repairs to be made to concrete floors and almost immediate use of the area after the repair is made.

Hardness Tester

Barber-Colman Co., Rockford, Ill., is manufacturing a portable impressor which can be used for spot checking material hardness of fabricated plastic

or non-ferrous metal parts. This hand hardness tester is suitable for use in any position and gives accurate readings even when operated by inexperienced personnel, according to the manufacturer.

3,000-4,000 Pound Forklift

The Baker-Raulang Co., 1250 West 80th St., Cleveland 2, Ohio, has announced a new series of forklift trucks in the 3,000 and 4,000-pound capacity class. The FT-30 class rated at 3,000 pounds capacity weighs approximately 6,600 pounds, has a wheelbase of 43 inches, single lift of 64 inches and telescoping lift of 126 inches. Outside turning radius is 73 inches. The FT-40, rated at 4,000 pounds, has the same basic dimensions and lifting reach except for a 5 x 1¾" fork section instead of the 4 x 1¾" section of the FT-30. Over-all weight of the larger unit is 7,500 pounds.

Fire Fighting Trailer

Porto-Pump., Inc., 227 Iron St., Detroit 7, Mich., has designed a new model Porto-Pump fire fighting trailer. The Porto-Pumper uses a demountable Porto Pump; 4 cycle gasoline engine; supply hose; aluminum extension ladder; 200 ft. of fire hose; fire axe and hand extinguisher; straight stream nozzle; combination fog and straight nozzle and a 200 gallon water tank. The Porto-pump will pump water from any source with equal ease. The 95-lb. unit can be demounted and carried to spots inaccessible to the vehicle in order to obtain the water supply. A wide variety of optional equipment is available. The 6' x 9' Porto-Pumper can be attached to any vehicle.

Inquiries about equipment on this page may be sent either to AMERICAN AVIATION or direct to the manufacturer.

Readers looking for sources of special equipment are invited to write to AMERICAN AVIATION's equipment editor. Every effort will be made to provide information on manufacturers and suppliers who are in a position to furnish or develop needed airborne or ground equipment.

Dry Chemical Extinguisher

Ansul Chemical Co., Marinette, Wis., has introduced its model B dry chemical fire extinguisher, a water-tight more rugged design of the earlier Ansul Model A unit. Ansul claims to have 12 improved design features in the Model B, including specially-designed seals in the nozzle and cartridge making them water-tight. Additional features include threaded hose connections, new cartridge guard finger grip and redesigned carrying handle. Model B is available in 20 and 30-pound sizes. Ansul recently announced price reductions on its fire extinguishing equipment and, on shipments of 200 pounds or more, freight allowances are being granted.

Storage Bins

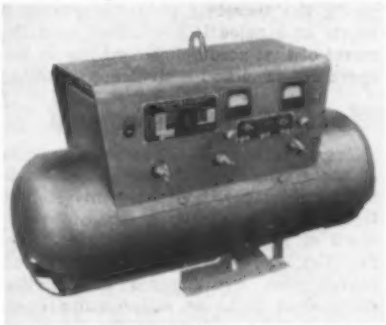
Lyon Metal Products, Inc., Aurora, Ill., is marketing new revolving bins for use in maintenance departments, tool rooms, etc., where it is necessary to store small parts in a readily accessible form. The revolving bins are complete storage units in themselves, each shelf has a continuous label holder and up to five additional dividers which can be added to each bin for smaller compartmentation. Wide spacing of the two bottom shelves assures full visibility of the lower compartments. Units, finished in green baked-on enamel, are available in the following sizes: 7-shelf unit, 34" diameter and 65-11/16" high; 4-shelf unit, 34" in diameter and 37-11/16" high and counter-top unit, 17 inches in diameter, 18⅜" in height.

Control System

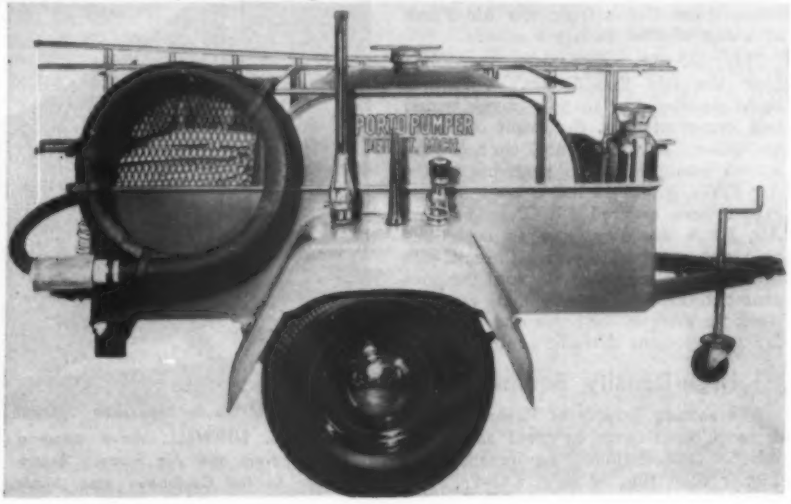
General Electric Co., Schenectady 5, N. Y., has introduced a simplified 28-volt generator control system providing for reverse-current, over-voltage, and differential-current protection. Main current-carrying items of the equipment must be located in the generator main power circuit adjacent to the main bus. Control relays are located in a drawout-type panel which is shockmounted and enclosed to protect the relays. Small control cables connect the panel and current-carrying units. The generator circuit provides two 250-millivolt shunts which provide indication for the differential-current fault protection; a contact by which the generator is switched on and off the line under normal operating conditions and a reverse-current circuit breaker to back up the contactor in interrupting high current faults and extreme overvoltages. Ease of maintenance is provided by providing easily replaceable drawout panels.

Aircraft Energizer

General Electric Co., Schenectady 5, N. Y., has designed a new 265-ampere aircraft energizer which supplies regulated power supply for all types of aircraft testing and maintenance work, for



starting small reciprocating aircraft engines, radio and radar testing, charging batteries, etc. The unit is a lightweight ground power supply suitable for medium requirements of low-voltage d-c power.



50% Break-Even Point:

Resort Airlines Prices New Tour Services at 3c per Mile

By KEITH SAUNDERS

Resort Airlines, which last month inaugurated its certificated all-expense air tours, has gone the operators of air coach services one better in the matter of providing low-cost air transportation.

Whereas virtually all the air coach services are flown under a 4c-per-mile tariff, Resort has placed a 3c-a-mile price tag on its tours.

Furthermore, L. C. Burwell, Resort's hustling president, says the company can break even on passenger load factors of 50% or better and will turn a respectable profit on the load factors of 70% to 80% which he is confident will be normal when the packaged tour project moves into high gear.

And this will be accomplished, Burwell asserts, with no freight, express or mail revenues and no subsidy—just passengers. It's all a matter, he says, of giving the traveling public a service it wants at a price it can afford, and the secret of that accomplishment lies in low operating costs and high-density loading.

Low Capital Investment

Resort is unusual in several respects. It has a minimum of money tied up in flight equipment, no money invested in ticket offices and only a modest investment of its own funds in maintenance facilities. And the number of its employes who are engaged in activities other than flight or maintenance operations can be counted on the fingers of two hands.

Equipment-wise, the company is in enviable position. It owns three DC-3's, each of which has been virtually zeroed as to engine and airframe time, and leases three C-46's from the Air Force at a cost of $300 each per month.

This leasing arrangement stemmed from the fact that Resort's operation, being devoted to vacation travel, would fold immediately in the event of future hostilities. Its planes and trained personnel would be made available to the Air Force within 12 hours after mobilization were ordered. It is, in fact, an Air Force designee, and as such was able not only to lease its three C-46's under a four-year contract with the government but to obtain a tacit commitment for more of the ships under a similar arrangement if traffic requires them.

High-Density Equipment

The seating density of Resort's C-46's is more than twice as great as that of other twin-engined equipment and higher than that of most DC-4's. The ships carry 60 passengers, such density being possible because:

(1) The C-46's are equipped with Pratt & Whitney R-2800-75 engines, each with a rated horsepower of 2,000, giving it a total of 4,000 horsepower, as against 2,400 for the average DC-3 transport and about 5,600 for the average DC-4.

(2) The C-46, designed as a troop transport, has an unsually large interior, and when no mail or freight has to be carried the bulkheads can be pushed forward and backward to provide maximum seating space.

(3) Resort's air tours are not operated in competition with other air services or on rigid schedules, and the planes may make comparatively frequent fuel stops.

With 60 seats available, when only 42 are filled (a 70% load factor), the airline's revenue amounts to $1.26 per plane mile, which should be profitable for any twin-engined operation.

Resort's DC-3's have only 28 seats, but this is high density for this type of equipment.

Major Overhauls Only

In its own shop at Pinehurst, N. C., supervised by Grady Rhyne, Resort does its No. 4 maintenance or major overhauls. All other maintenance (Nos. 1, 2 and 3) is performed by other carriers under contract, which obviates the necessity of Resort having to maintain expensive equipment and personnel at each of the airports on its routes.

Pan American Airways, which fought hard against Resort's certification, is now cooperating with it and does its maintenance at most of Resort's tour points in the Caribbean area, Mexico and South America, the only exceptions being Curacao, Netherlands West Indies, where Resort has a contract with KLM Royal Dutch Airlines, and the Virgin Islands, where its maintenance is done by Caribbean-Atlantic Airlines.

This is a good arrangement for all concerned, since it gives PAA and the other established carriers additional profitable utilization of equipment and personnel that would otherwise be idle and at the same time makes it unnecessary for Resort to maintain equipment and personnel for which it would have relatively little use.

Can Exchange Parts

Another good feature for Resort is that if it finds itself in Havana, Guatemala City or some other such point in need of a spare engine, propeller or tire, Pan American will either furnish one out of its own stores at that point or will fly one in from the nearest point at which it has the needed equipment. It will charge Resort a stipulated amount per plane mile for such flying.

In addition to maintenance, Resort's contracts with the other carriers provide that they perform all ground handling functions for the tour operator.

Because of these arrangements, Resort is able to conduct its operations with a comparatively small number of personnel. Of the approximately 75 employes now on the payroll, about 35 are in the

LEWIS C. BURWELL, shown standing before one of the C-46's leased by Resort Airlines from the Air Force. Resort inaugurated certificated all-expense air tours to the Caribbean area, Mexico and South America on January 28.

Pinehurst shop and another 25 to 30 are pilots.

But what about sales personnel and reservationists? Can any airline get along without these? Well, Resort can, or at least it expects to. It has only two people directly engaged in sales work. One is Arthur V. Doyle, veteran airline sales executive, who is general sales manager, and Bill Tyler, Resort agency manager in Miami. Resort's sales are handled almost entirely by travel agents.

Attractive for Agents

And the travel agents are enthusiastic about selling Resort tours for two reasons: Resort hands them a variety of attractive packaged tours with a relatively low price tag on them, and all the work normally required of a travel agent, such as arranging for guided tours, booking hotel accommodations and providing recreation, are taken care of for Resort by the experienced firm of Thos. Cook and Son.

"All the agent does is write out a ticket and await for the postman to bring him his fees," said Burwell. That's why Resort requires no heavy investment in ticket offices and sales staff.

Domestic Airline Tie-Ins

Another smart thing Resort is doing is to arrange for a tie-in booking system with certificated domestic carriers. The first of these was made with Capital Airlines, and under it Resort passengers in Capital's territory are flown by Capital to Washington, where they are picked up by a Resort flight originating in New York. Capital's regular round-trip fare is added to the cost of the tour in such cases.

Similar arrangements are now being made with several other carriers, the net effect being to greatly simplify Resort's operation. Instead of having to operate its own aircraft out of such points as Cleveland, Chicago, Detroit and Pittsburgh, all of which are on its certificate, it can concentrate on originating all flights either in New York or in Miami. This means a distinct saving to Resort and at the same time means additional business for the airlines that will "feed" passengers to it at New York, Washington and Miami.

Initially, Resort is offering four different "Suncruises," three of these operate from Newark, with stops at Philadelphia Washington and Miami, and the fourth originates at Miami. The latter makes a circuit covering Grand Bahama Island, site of Billy Butlin's $8,000,000 Bahamas Vacation Village; Nassau; Havana and return to Miami.

Up to 14 Days

The "Palmlands" cruise from Newark takes seven days and costs $235, of which $105 goes for air transportation. This also takes in Grand Bahama, Nassau and Havana. The 14-day, $395 "Latinlands" cruise also touches at Havana and includes a week in Mexico City and visits to the Mayan ruins at Yucatan. The "Tropiclands" cruise at the same price swings through the Caribbean in nine days, with stops at Jamaica, Dominican Republic, Virgin Islands, Puerto Rico, Haiti, Havana and Miami.

Time Saver—Combination scale and stamp vendor, made by Hamilton Scale Co., Toledo, O., requires little floor space and relieves employes of handling stamps for insurance policies.

The short cruise out of Miami and the "Palmlands" out of Newark are operated on a daily basis, while the longer cruises are operated once a week at present. If business warrants, they will be operated more frequently. Resort also will start operating scheduled tours to Canada, as permitted in its certificate, in the early future. The certificate, incidentally, stipulates that Resort shall call at a minimum of three foreign ports on any of its cruises, but there is no limit to the total number of certificated ports that may be served. There are 30 foreign points included in the certificate.

Burwell, a wartime combat pilot, noted the grand rush of veterans into the passenger and freight business when he got out of the service in 1945, and decided that the smart thing to do would be to provide an air transport service that would interest tourists. He and his brother, Clayton, organized Resort in the fall of 1945, and soon were busily operating charter flights to various resorts, having meanwhile filed an application for a CAB certificate to operate scheduled tours.

Truman Overrules CAB

Most of the certificated airlines fought Resort's proposal, and the CAB finally handed down a decision last February denying it a certificate. But President Truman, who has the final say with regard to certificated international operations, found it "desirable and proper" that Resort be certificated, so on June 10, 1949, the line was issued a five-year certificate.

"Ours is a market concept, not a geographical concept of air transportation," Burwell explains. "The domestic and international route patterns were pretty well fixed when we got into the business, so we had to offer something different, and we believe that is what we are doing with our low-fare all-expense tours.

"We use the airplane as an intrument of utility instead of speed. We operate at the lowest costs consistent with safety and dependability, but because we are not burdened with having to perform common carrier service, are not subject to International Air Transport Association tariff limitations, and can operate at a high density of seating, we can give the traveler a 3c-a-mile fare and make money at it.

"We do not want regular air travel. We do not compete with other carriers, nor do we seek to divert any of their traffic. We seek and carry traffic that we and our agents create through low fares and attractive packaged tours. Resort's operation is just that simple."

CAB Briefs

A **Northwest Airlines** tariff proposing a 30-day round-trip excursion fare of $350 between Honolulu and Anchorage, Alaska, has been suspended by the Board through April 19, pending investigation.

CAB has reissued the certificates of Pan American Airways, Inc., to reflect the change in corporate name to **Pan American World Airways, Inc.**

The Board has extended for one year the exemption under which **Trans World Airline** serves Rome, Athens and Jerusalem as intermediate points between points in Tunisia and Egypt on segment 2 of its international route. The authorization is temporary pending adequate airport facilities at Tripoli and Benghasi, regular certificated points on the segment. Rome, Athens and Jerusalem are regular points on segment 1 of TWA's routes.

An increase in **Piedmont Aviation's** temporary mail rate that would provide the carrier with an additional $38,000 for the 19-month period ended September 30, 1949, and approximately $1,276,000 for the subsequent 12 months, has been proposed by the Board. Based on a daily base mileage of 8,332, the proposed rate would be 50c per mile from October 1, 1949, through June 30, 1950, and 45c per mile on and after July 1.

The Board has initiated an investigation to determine whether **Northwest Airlines** may have engaged in unfair methods of competition and whether two trucking concerns, Fly Freight, Inc., of New York, and Sterling Freightways of Minneapolis, may have engaged in airfreight forwarder activities without appropriate authority. It is alleged that Fly Freight has consolidated numerous shipments from various consignors in New York and shipped them in bulk lot to Sterling at the lower NWA rates applicable to bulk shipments, rather than at the higher rates normally applied to the individual shipments.

Operation
"EFFICIENCY"

PAC
ESTABLISHED 1928
THE FLYING TIGER LINE, INC.

WE'RE KNOWN BY THE COMPANY WE KEEP!

The famous "Flying Tigers" of World War II are legend among airmen of all nations. Now, the daring and initiative of this famous group has been channeled into a fast moving, efficient peacetime freight operation. PAC, the world's most experienced maintenance and supply house is proud to be a partner to the continuing success of this forceful group of men. PAC's association with the Flying Tiger Line is just further evidence of the growing partnership between PAC and the greatest airlines in the world...and further evidence of "OPERATION EFFICIENCY"

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Over the Counter

By Eric Bramley

Sales Promotion

SOMETHING new (at least in recent years) has been introduced by **Western Air Lines**—a "packaged marriage plan," under which couples can fly from Los Angeles to Las Vegas, have the ceremony performed in the airplane at the airport by a justice of the peace, and return to Los Angeles, all in slightly over four hours. The plan operates in connection with Western's new coach-excursion daily round-trip now flown between the two cities. Cost is $19.90 round-trip per person plus $10 to cover marriage license and justice of peace fees. Western makes all arrangements in advance.

Braniff Airways, all out on an effective promotion drive, has formed a Business Bureau, whose purpose is to promote trade. The bureau has announced availability of a trilingual staff in the U. S. and Latin America for consultation to businessmen about trade problems, offers assistance in introduction of U. S. businessmen to Latin American businessmen, bankers and other officials, and will help with visas, hotel reservations, etc. Company has also issued a 10-page "Report on the State of the Nation," on the economic future of the Braniff States of America, the nine-state area served by the airline . . . **Railway Express Agency** is distributing "Reference File of Air Express Uses"—case histories of people who have used air express.

Duncan Hines' new report on lodging and dining in Hawaii has been published by **United Air Lines** for distribution on Honolulu-bound planes, through UAL ticket offices and travel agents . . . **Pan American World Airways** on Jan. 22 resumed Convair half-hour ($3 plus tax) sightseeing flights over Miami . . . **American Airlines'** sales department is having a "spring holiday" contest, with worthwhile prizes for department personnel and stewardesses who, during 1950's first three months, turn in outstanding sales efforts.

Passenger Service

YOU have by this time, no doubt, looked at the accompanying picture. It's a sign used by **Braniff Airways**. Here's what Rex Brack, the company's general traffic and sales manager, says in a letter to us: "I like to tell you occasionally of some of the things we do at Braniff, which, seemingly small elements in our service organization pattern, nevertheless contribute to our reputation as a public servant. For instance, a passenger who decides to wash his hands in flight is considerably miffed at finding no water and feels that freezing altitude is no excuse. For him we have installed picnic jugs in our DC-4's and attached the enclosed sign. A clean passenger is a happy passenger." It's a clever and unusual sign.

WE ADMIT
THIS JUG IN OUR LAVATORY
IS REMINISCENT OF
THE OLD PITCHER AND BOWL DAYS,
AND IS NOT IN KEEPING
WITH THE AIR AGE.
BUT TO BE PERFECTLY FRANK, NO ONE HAS DEVELOPED
A PRACTICAL WAY TO KEEP OUR WATER STORAGE TANKS
FROM FREEZING DURING EXTREMELY COLD WEATHER.

Traffic, Tariffs and Tours

PREPARING its fight to hold its El Centro-Yuma segment, **Western Air Lines** on Feb. 1 was to increase Los Angeles-Yuma service from three Convair trips weekly to two DC-3 trips daily. Company will ask CAB to reconsider recent Los Angeles-Phoenix extension awarded to **Southwest Airways**. Same decision ordered WAL to suspend temporarily at El Centro and Yuma and show cause why El Centro-Yuma-San Bernardino-Palm Springs shouldn't be suspended.

In the battle for Holy Year business, **Pan American World Airways** has announced an all-expense two-week tour for $582 to Rome, Nice, Paris and London. The tour, separate from the pending Felix Roma proposal, will operate through connecting carriers serving Rome, and expires Mar. 16, when the fare-and-a-tenth round-trip Atlantic excursion rate ends . . . **Delta Air Lines** has asked CAB permission to extend Miami-Chicago non-stop coach flights beyond May 15 to Nov. 15 . . . **Pan American** on Jan. 16 inaugurated twice-weekly tourist service between Houston, New Orleans and Panama.

U. S. Domestic Airline Traffic for November

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor %	Mail Ton-Miles **	Express Ton-Miles	Freight Ton-Miles	Total Ton-Miles Rev. Traffic	Available Ton-Miles Flown	% Available Ton-Miles Used	Revenue Plane-Miles	Scheduled Miles	% Scheduled Miles Completed
American	249,745	116,659,000	194,920,000	59.85	715,887	551,584	3,044,247	15,730,721	27,341,911	57.53	4,641,621	4,568,999	99.33
Braniff	51,058	16,911,000	31,467,000	53.74	89,461	83,879	127,852	1,919,428	3,850,113	49.85	963,300	945,986	99.88
Capital	95,938	29,072,000	66,133,000	43.96	101,203	192,840	715,276	3,785,131	8,273,778	45.75	1,838,349	1,808,176	97.13
Caribbean	4,338	342,000	1,055,000	32.42	563	. . . .	2,312	30,444	108,655	28.02	45,410	47,544	94.54
C & S	27,203	8,489,000	16,449,000	51.61	40,726	46,212	64,306	965,671	1,918,915	50.32	594,726	585,120	99.55
Colonial	13,178	3,437,000	6,410,000	53.62	8,866	8,425	7,891	370,698	833,062	44.50	304,523	302,160	98.45
Continental	14,352	5,254,000	12,871,000	40.82	15,717	8,415	29,172	556,152	1,361,087	40.86	457,320	445,870	99.98
Delta	42,507	15,857,000	31,607,000	50.17	68,159	62,276	177,515	1,831,203	4,443,818	41.21	1,058,833	1,055,277	99.59
Eastern	174,605	73,585,000	144,856,000	50.80	403,554	329,425	863,030	9,209,022	20,794,638	44.29	4,297,015	4,360,895	97.73
Hawaiian	21,168	2,832,000	4,838,000	58.54	4,378	9,976	44,600	303,766	541,657	56.08	227,699	195,677	98.89
Inland *	6,487	2,361,000	4,556,000	51.82	8,646	5,457	8,153	248,573	472,109	52.65	231,506	232,200	99.70
NCA	27,218	7,841,000	14,594,000	53.73	24,375	18,364	30,672	824,151	1,667,918	49.41	694,966	682,392	99.91
National	22,683	12,689,000	31,939,000	39.73	36,305	62,211	147,159	1,538,999	4,420,794	34.81	907,336	887,580	99.70
Northeast	23,011	4,410,000	10,698,000	41.22	10,229	17,053	15,785	451,802	1,077,738	41.92	338,367	341,136	96.94
Northwest	56,556	33,543,000	69,252,000	48.44	221,748	140,082	421,808	4,080,047	8,656,136	47.13	1,679,081	1,664,414	97.56
Trans Pac.	5,527	723,000	1,932,000	37.42	. . . .	55	2,148	66,189	173,418	38.17	68,913	47,773	91.81
TWA	106,314	66,868,000	113,812,000	58.75	641,515	439,520	1,121,375	8,623,046	14,585,131	59.12	3,517,341	3,488,866	97.60
United	156,559	90,400,000	150,640,000	60.01	864,202	616,565	2,117,342	12,251,188	23,048,051	53.15	4,153,272	4,146,170	98.08
Western *	35,208	12,934,000	26,249,000	49.27	59,559	38,583	32,090	1,364,010	2,793,996	48.82	644,204	587,262	94.98
TOTALS	1,133,655	504,207,000	934,289,000	53.96	3,315,093	2,630,922	8,972,733	64,150,241	126,362,925	50.76	26,663,782	26,393,497	98.29

* Operations of Western and its subsidiary, Inland, should be considered as consolidated, although reports are filed separately as shown here.
** Includes air parcel post.

U. S. Domestic Airline Revenues & Expenses for October

Airlines	Total Operating Revenues	Passenger Revenues	Mail Revenues	Express Revenues	Freight Revenues	Excess Baggage Revenues	Non-Scheduled Transport Rev.	Total Operating Expenses	Aircraft Operating Expenses	Ground & Indirect Expenses	Net Operating Income
American	$ 9,341,623	$ 8,006,837	$ 437,961	$ 164,358	$ 568,361	$ 92,467	$ 15,363	$ 7,899,139	$ 3,856,493	$ 4,042,646	$ 1,442,484
Braniff	1,343,562	1,044,013	205,657	19,763	27,771	8,530	34,469	1,214,704	594,559	620,145	128,858
Capital	2,494,387	1,737,013	406,577	62,196	154,322	10,067	99,776	2,365,536	1,135,848	1,229,688	128,851
Caribbean	46,169	29,352	13,720	. . . .	1,969	229	. . . .	65,356	28,394	36,962	-19,187
C & S	815,449	606,359	157,255	14,879	12,996	6,970	12,724	665,162	292,170	372,992	150,287
Colonial	386,882	268,455	108,284	2,078	4,275	1,710	. . . .	355,765	168,319	187,446	31,117
Continental	464,999	314,205	112,171	2,154	9,285	2,578	19,053	466,706	216,371	250,335	-1,707
Delta	1,342,933	1,019,573	245,954	15,187	41,982	11,041	6,771	1,310,267	647,993	662,274	32,665
Eastern	5,380,603	4,784,691	257,133	82,371	157,258	66,506	11,177	5,408,136	2,884,737	2,523,399	-27,534
Hawaiian	233,188	182,953	2,758	9,896	26,367	5,649	2,658	273,791	108,451	165,340	-40,602
Inland *	222,078	166,192	49,051	1,798	2,289	1,557	928	186,436	77,140	109,296	35,642
NCA	677,554	519,579	124,441	6,217	7,885	4,856	13,142	598,459	270,011	328,448	79,095
National	947,326	744,488	144,289	22,645	13,620	16,979	. . . .	1,092,066	566,441	525,625	-144,740
Northeast	492,786	313,911	133,455	2,731	8,953	1,119	2,400	476,262	235,289	240,973	16,523
Northwest	2,697,292	2,264,933	250,027	40,454	88,175	17,027	19,980	3,041,306	1,582,020	1,459,286	-344,014
Trans Pacific	57,637	36,188	. . . .	. . . .	2,273	675	17,124	83,558	33,813	49,745	-25,922
TWA	5,734,744	4,761,491	453,274	123,245	235,247	53,055	75,133	5,144,081	2,398,475	2,745,606	590,663
United	8,007,589	6,709,285	521,672	183,588	397,251	58,780	76,178	7,014,079	3,319,903	3,694,176	993,511
Western *	788,060	471,148	154,744	7,838	6,322	3,547	137,665	757,231	376,970	380,261	30,828
TOTALS	41,474,861	33,980,666	3,778,423	761,398	1,766,601	363,342	544,541	38,418,040	18,793,397	19,624,643	3,056,818

* Operations of Western and its subsidiary, Inland, should be considered as consolidated, although reports are filed separately as shown here.
NOTE: These figures are taken from monthly reports filed by the airlines with CAB. The data are tentative and subject to later change.

U. S. International Airline Revenues & Expenses for October

Airlines	Total Operating Revenues	Passenger Revenues	U. S. Mail Revenues	Foreign Mail Revenues	Express Revenues	Freight Revenues	Excess Baggage Revenues	Non-Scheduled Transport Rev.	Total Operating Expenses	Aircraft Operating Expenses	Ground & Indirect Expenses	Net Operating Income
American	$ 295,166	$ 251,824	$ 6,186	$ 5,981	$	$ 19,153	$ 4,074	$	$ 289,191	$ 157,253	$ 131,938	$ 5,975
Amer. O'Seas	2,033,185	1,442,346	360,317	92,865	96,988	. . . .	21,484	10,500	2,080,225	1,194,903	885,322	-47,040
Braniff	377,103	225,614	135,543	1,728	. . . .	7,340	5,089	. . . .	405,111	177,925	227,186	-28,008
C & S	294,838	150,752	128,179	960	. . . .	7,554	7,287	. . . .	300,140	158,495	141,645	-5,302
Colonial	86,673	55,966	29,129	284	. . . .	345	75	. . . .	120,341	58,108	62,233	-33,668
Eastern	64,263	52,218	4,858	. . . .	. . . .	4,959	726	1,503	75,706	37,536	38,170	-11,443
National	108,716	86,226	8,491	. . . .	10,854	. . . .	2,834	311	126,293	51,464	74,829	-17,577
Northwest	1,051,653	402,490	480,816	29,742	1,979	130,140	5,667	. . . .	750,749	327,544	423,205	300,904
Panagra	1,325,098	871,731	310,501	45,603	65,727	. . . .	26,275	-5,900	1,049,201	506,288	542,913	275,897
PAA												
Latin Amer	5,282,046	2,790,990	1,577,382*	141,135	569,479	. . . .	88,439	51,040	5,021,490	2,293,106	2,728,384	260,556
Atlantic	5,512,022	2,214,692	2,732,699*	187,096	318,997	. . . .	54,468	. . . .	4,855,923	2,746,571	2,109,352	656,099
Pacific	3,234,012	1,200,724	1,652,435*	99,640	265,718	. . . .	21,668	. . . .	2,876,117	1,585,239	1,290,878	357,895
Alaska	440,797	216,452	97,143**	. . . .	125,393	. . . .	1,161	. . . .	414,732	198,399	216,333	26,065
TWA	3,581,301	2,199,514	787,752	262,945	203,512	. . . .	66,496	32,401	2,907,542	1,580,835	1,326,707	673,759
United	308,190	241,013	37,169	. . . .	15,872	. . . .	2,133	. . . .	317,327	175,463	141,864	-9,138
TOTALS	23,995,063	12,392,552	8,348,660	867,979	1,674,519	169,491	307,876	99,855	21,590,088	11,249,129	10,340,959	2,404,974

* Represents company's estimate of amount which should be received in accordance with the terms of the Civil Aeronautics Act when permanent rates are established. Estimate exceeds temporary rates in effect by:
Latin American Div. $1,206,123; Atlantic Div. $-429,169 (figured on $1,923,699 excess for Oct. less adjustment Jan. 1 to Sept. 30 of $-2,352,868); Pacific Div. $777,231
** Temporary rates in effect exceed estimate by $15,294.

NOTE: Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; C & S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

DELIVERY—

Via the Air Route

The Military Air Transport Service (MATS) contributes to the mobility of the Armed Forces by airlifting cargo and personnel *whenever* and *wherever* needed to fulfill national military requirements.

Fairchild C-119 Packets, soon to be flying for the Military Air Transport Service, help fulfill this vital air transportation mission. Capable of carrying 64 passengers or 10 tons of cargo, this twin-engine transport and cargo plane has the *versatility* to accomplish numerous types of operations required via the MATS Air Route.

The C-119's unique rear loading at truck-bed height allows for rapid handling of cargo, eliminating the necessity for extra ground handling equipment. Airplane engines and parts, bulky communication equipment, vehicles, tanks and field kitchens are some of the many military items the Fairchild C-119 carries with ease. In addition to its utility as a cargo plane, the Packet is equally efficient for air-evacuation, air-sea rescue, and personnel transport.

The C-119 is one of a series of Fairchild transport planes which will continue to play a versatile role in the operations of the world wide Military Air Transport Service.

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Turf Growth and Maintenance Methods Described by CAA

How to establish good turf and then maintain it is one of the most bothersome problems confronting owners and operators of the more than 5,000 airports in this country that have unpaved landing areas, and the hundreds that have one or more paved runways but acreages of turf between and off the runways.

The Civil Aeronautics Administration has prepared a helpful booklet, AIRPORT TURFING, which describes in detail the problems involved as well as the methods used in the establishment and maintenance of a good turf.

CAA points out that a good turf landing strip is still favored by the majority of operators of lightplanes and is being used increasingly by relatively heavier planes through greater extremes of weather.

"Turf," the agency says, "is used on airports as a wearing surface for traffic areas; to control dust and erosion; to improve the appearance of the airport, especially the grounds around buildings and parking areas; to provide recreational grounds; and, when grown on selected areas for seed, serves as a means of producing revenue . . ."

Turf Is Economical

"Its primary advantage is economy, both in initial development and subsequent maintenance. It makes adequate airport facilities possible for small communities at a cost in proportion to the revenue and advantages to be derived from such an installation."

Continuing, CAA points out that the turfed airport lends itself in an excellent manner to those airport sponsors who are uncertain as to the future of aviation in the municipality, in that this type of airport may easily be so planned and designed that it is the first step in a construction program that can be extended over a period of years.

Discussing the natural factors of climate, soils and topography that influence the development and maintenance of turf, the publication tells what weight should be given to these factors during the early stages of airport planning, particularly in site selection.

It classifies turfed areas on an airport as (1) frequent-traffic areas; (2) occasional-traffic areas, and (3) non-traffic areas, and gives tips as to what kind of turf should be planted—and why.

After detailed discussions of available grasses, soil characteristics, grading and irrigation problems, temporary cover crops, mulching, compacting, watering and planting methods, the booklet devotes a full chapter to turf maintenance.

This deals with mowing practices and mowing equipment, refertilizing, rolling, weed control, pest control and renovating and policing of turfed areas.

Typical of the booklet's content is what it has to say regarding equipment used for mowing, which it says is one of the most important factors in growing and maintaining turf. On this it says:

Mowing Equipment

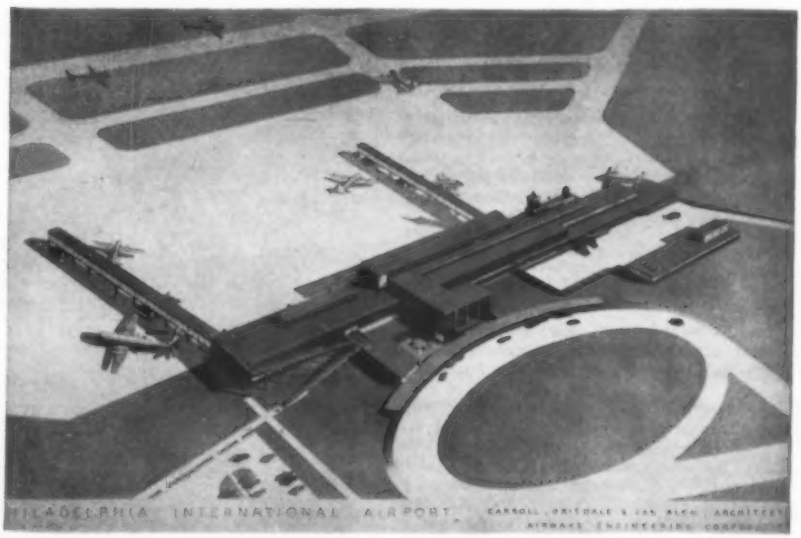
"Several types of mowing equipment are available for cutting grass on airports. The most effective and economical type for mowing the large flat areas is the high-speed, reel-type gang mowers. These may be used in gangs of from three to seven or even nine units, may be towed at speeds of from 8 to 12 miles per hour and are capable of mowing up to 20 acres or more per hour wherever the ground is comparatively smooth.

This rate of mowing is dependent upon the use of high-speed tractors or other suitable tugs. If the slower farm or highway tractor is used, the mowing performance will be reduced.

Speed of mowing, especially on turfed landing strips or shoulders of pavements, in order not to interfere with flight activities, is an important factor on most airports. More frequent mowings will be required by reel-type mowers than by the sickle-bar type, since the former will not cut tall vegetation."

The latter type of mower, CAA says, is much slower than the reel-type mower but is effective equipment for use on occasional and non-traffic areas where mowings may be less frequent or for areas of low-growing species which require mowing only as necessary for weed control.

"Sickle-bar mowers," says the booklet,



Philadelphia Building—Bids will be opened February 28 on a contract for construction of this "finger" type terminal building at Philadelphia International Airport. Building will have 230,000 square feet of space, exclusive of the "fingers," will cost about $5,000,000 in the initial stages, and should be completed in 18 months to two years. Carroll, Grisdale and Van Alen of Philadelphia designed the building under the direction of Airways Engineering Corporation of Washington. Airlines and the city abandoned a "peripheral" type design in favor of this one after long study. Provision will be made for future extension of the building westward.

"should be operated at speeds not in excess of four miles per hour. They cut a swatch of only five to seven feet, depending on the length of the blade. In general, it may be said that the cost per mowing by sickle-bar mowers will amount to five to ten times that of mowing by reel-type mowers.

"Small equipment such as the power scythe, the reel-type or the whirling knife power mowers, capable of mowing three to four acres per day, are useful for small or inaccessible areas and for trimming."

Equipment Care

It added that "care in operating and maintaining mowing equipment is essential for its most economical performance, and suggested that policing of the turfed areas before mowing and filling in ruts and holes will avoid most of the serious breakdowns of machinery."

The information contained in the booklet summarizes the knowledge and experience gained during the past several years in the development of turf at military and civilian airfields, as well as results of experimental work conducted by federal and state agencies.

Since AIRPORT TURFING is not intended as a complete coverage of the subject, it is suggested that airport operators having specialized problems consult the agronomists on duty at each of the CAA regional offices.

Copies of the booklet are available from the U. S. Government Printing Office, Washington 25, D. C., at 25c per copy.

Airport People

Dr. James E. Mooney, former director of the Bureau of Aeronautics, Pinellas County, St. Petersburg, Fla., has been named chief of the operations and maintenance branch of CAA's Office of Airports in Washington. He has been replaced as a member of the Airports Advisory Committee by **Arthur C. Hyde,** owner and operator of Congressional Airport at Rockville, Md., and Hyde Field at Clinton, Md., owner of the Leesburg (Va.) Airport, and chairman of the board of directors of the Martinsburg (W. Va.) Flying Service.

Frederick M. Smith, wartime commander of the Chincoteague Naval Air Station, has been appointed manager of the Salisbury-Wicomico County (Md.) Airport . . . **Richard S. Boutelle,** president of Fairchild Engine and Airplane Corp., has been appointed a member of the Maryland State Aviation Commission. **Charles Z. Heskett** is the new chairman, succeeding Maj. Gen. Philip Hayes, deceased.

William G. Fuller, former chief of the airport management section of the Civil Aeronautics Administration, is now city aviation director at Fort Worth, where he was airport manager from 1927 until 1942.

Surplus Military Airports Earn Own Keep In Nebraska

By KEITH SAUNDERS

Five surplus military airfields that might otherwise have grown up in weeds have been successfully salvaged by the Nebraska Department of Aeronautics and developed into useful self-supporting facilities.

The airports in question are located at Bruning, Fairmont, Harvard, Scribner and McCook. When the War Assets Administration declared them surplus in early 1946, and the towns nearest them showed no interest in their acquisition, the Department of Aeronautics thought it should preserve the fields as airports in being.

Ramsey

So, in exchange for a token payment and a pledge to maintain the fields as public airports, the state acquired five airfields on which the government had spent some $37,000,000 in land acquisition and construction costs. Averaging 1,800 acres, each of the fields has three 7,000-foot runways and a 40-acre parking ramp.

Each field also has five large hangars, a number of operations buildings and barracks, complete water and sewer systems, and such miscellaneous equipment as mowing machines, road graders, dump trucks and fire engines.

James D. Ramsey, director of aeronautics, and Neil Withrow, supervisor of airports, decided upon a policy of operating the five fields entirely from their own revenues, with no assessment to be made against the taxpayers of the state in the way of an appropriation for their operation and maintenance. This was no small order, since the majority of the buildings on the airports had been removed, the remainder were in a somewhat run-down condition, and many of the vehicles were in a state of disrepair.

The first step—and a most important one—was to find a capable full-time custodian for each field. This was not easy, since the men needed to be able to do minor repair work on every facility on the fields, but suitable men were found after a while.

The second phase was to insure that every source of non-aeronautical revenue was developed in order that the aviation facilities be kept from deteriorating during the long process of building up aeronautical revenues.

Tillable Areas Leased

The most obvious source of income was seen in making agricultural use of portions of the fields not needed for aeronautical use, and it was found that there was an average of 1,000 acres of tillable land on each of the five airports. A standard agricultural lease was executed on each field, with one farmer cultivating all the land on each of five of the fields and the other being broken

Nose Hangar—This is the first unit of United Air Lines' new nose hangars to be completed at the Seattle-Tacoma Airport. The hangar will accommodate two Douglas DC-6's. Basic dimensions are 260 feet by 70 feet but the design allows for future expansion. Stock rooms, shops and general offices are provided in the forward part of the building. Note the heavy gage curtains which are used in place of doors to close off the main openings into the hangars.

up into six farm plots. The income from the farmland was earmarked in each case for major repair work and capital improvements.

The next step was to obtain all possible revenue from the buildings and the flight line, with this money to be used to pay for upkeep, salaries and operating expenses. Finding tenants for the buildings was not easy, since each of the airports was far removed from the nearest town. A small housing unit was developed on one field and on others the rental units proved attractive for poultry projects, grain storage, combine storage, contractors' repair shops, and long-term warehousing.

Long-Range Renovation

After developing the immediate and more obvious sources of revenue, the state began making long-range plans for continuing income, while at the same time keeping expenses to a minimum. Under this program, buildings are being converted into permanent structures, runways are being repaired, obsolescent rolling stock is being replaced with new equipment, and utilities systems which were designed for military usage but are not economical for civilian usage are being renovated.

With day-to-day expenses being covered by day-to-day revenues, the five fields are now self-sufficient, and the agricultural income is available for capital improvements and major repairs, as originally planned.

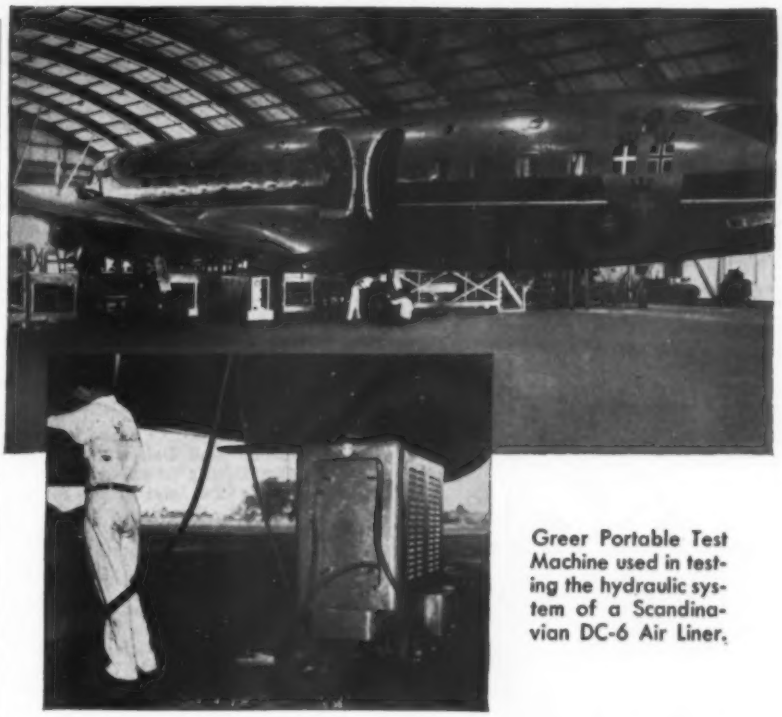
Meanwhile, flight operations are in progress on three of the fields, catering primarily to farmers from the surrounding countryside, and plans are made to put in minimum services at the other two. Furthermore, the state is confident that other as yet undeveloped sources of revenue, together with agricultural income, will keep the five fields on a self-supporting basis. Meanwhile, every effort is being made to attract the non-flying public to the airports, with the idea that the non-flying public will eventually become the flying public and the aeronautical revenues of the fields can be increased substantially.

Also, the state is getting valuable ideas from its operation of these "guinea pig" airports that can be passed on to municipalities to help them make their airports self-sufficient.

Traffic Study Report Due On Three Major Terminals

Studies of traffic problems at three major air terminals by a working subcommittee of the Civil Aeronautics Administration's Airport Use Committee are now nearing completion, and the findings will be reported to the full committee in the near future.

The group's recommendations will be aimed at providing ways and means for joint civil and military use of major airports while at the same time minimiz-



Greer Portable Test Machine used in testing the hydraulic system of a Scandinavian DC-6 Air Liner.

SCANDINAVIAN AIRLINES RELY ON GREER TEST MACHINES

JOHN S. ANDERSON
Supervisor of Operations
Scandinavian Airlines System, Inc.

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ing traffic density and achieving the highest degree of safety to all users. The working group is headed by Paul H. Stafford, chief of CAA's airport planning division, while Administrator D. W. Rentzel heads the full committee.

At Chicago Municipal Airport, first facility to be studied, no major traffic problems were noted during the three days the group spent at the field Similar studies were made at St. Louis and at Minneapolis/St. Paul.

Airport Notes

The Port of New York Authority has awarded a contract to Construction Aggregates Corp. and Peter Kiewit Sons' Co. for the placing of fill and installation of subsurface sand drains at **Newark Airport** . . . Three resolutions have been introduced in the N. Y. state legislature for an investigation of the powers and practices of the Port of New York Authority.

City of Philadelphia has advertised for bids for contsruction of a new $6,000,000 finger-type terminal building at **Southwest International Airport**. . . . Dade County Port Authority reports tnat **Miami International Airport** showed a net profit of $351,297 for the fiscal year ended last September 30.

San Francisco's Airport Department wants to build a $450,000 close-in **airport on Treasure Island** for use by private and executive type aircraft and possibly by feeder airlines. Chief obstacle is getting government permission to build the field and have free access to it from the Bay Bridge. It would be only 15 minutes from downtown.

Name of Evansville (Ind.) Municipal is being officially changed to **Beeler Airport**, honoring Jerome D. Beeler, president of the Board of Aviation Commissioners.

The largest privately-owned airport in New Jersey is scheduled to be constructed on a 250-acre tract near **South Plainfield**. It will serve Union, Middlesex, Somerset and Morris counties and will cater to commercial and private planes.

CAA Airport Grant Offers

For the week ended January 6, the Civil Aeronautics Administration made Federal-aid airport grant offers totaling $300,422 to nine communities, as follows, with classes in parentheses:

Arizona: Chandler Municipal (2). $1,703.

California: Metropolitan (Van Nuys) Airport, Los Angeles (5), $17,065.

Georgia: Atlanta (Fulton County Airport), (3), $80,000.

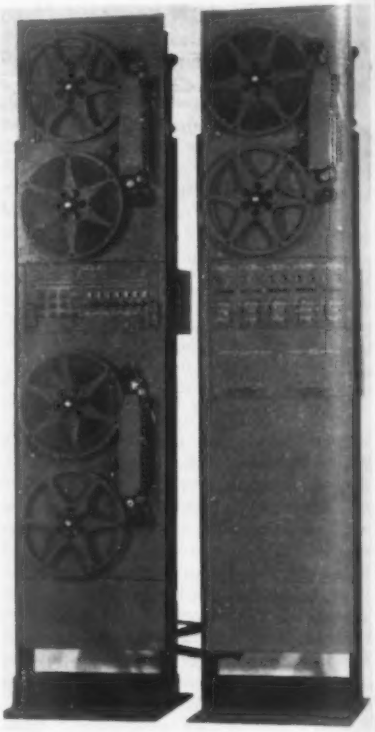
Kansas: Garden City Airport (5), $9,650; Manhattan Municipal (2), $80,000.

Nebraska: Grand Island Mun. (6), $20,054.

North Carolina: Rocky Mount Mun. (3), $20,950.

Ohio: Dayton Mun. (4), $65,000; Springfield Mun. (4), $6,000.

These boosted to 1,081 the total of grant offers made under the Federal Airport Program, and increased the Federal funds involved to $97,548,481.



Improved Recording Device Covers 14 Radio Channels

A new device scheduled for demonstration at Cleveland late in January will make continuous recording of all messages passing through the aircraft control center economically feasible for the first time. The new unit, a multichannel airport communications recorder, is built by the Brush Development Co. of Cleveland.

The first pair of units of this type has already been delivered to Aeronautical Radio, Inc., for use at the combined airlines communications center in Los Angeles.

Unlike previous systems, the new unit will record both the pilot's and controller's conversations and fix a time relationship which will be particularly useful in checking on verbal exchanges which occurred during emergency conditions.

Basic cost of a single unit is approximately $5,000. This will enable coverage of 14 communications channels simultaneously and provisions can be made for covering additional circuits.

Based on the unit with 14 channels coverage, average cost per hour per channel for the recording medium is 0.3c while cost per hour per channel attributable to depreciation, based on a five-year write-off, is 0.8c.

Since the equipment life should extend well beyond five years and additional re-use of recording tapes is highly probable, these hourly costs may be even lower in practice.

Civilian Flight Schools Offer Economical Military Potential

By B. J. WARD

Flight school members of the Aeronautical Training Society have a civilian potential for training more than 9,000 military cadets without expanding present facilities, according to a survey just completed by Wayne Weishaar, ATS Secretary.

"Within 30 days, the civilian flight operators could start 9,082 cadets in their flying training," says Weishaar. "Of 31 member flight schools in 20 states now carrying in flight activities, the survey shows that these bases own and have in operation 685 airplanes. Within a month, we could start 3,580 cadets on cub type trainers, 3,041 cadets on PT type planes and 2,461 cadets on T-6 type planes."

Interest of the Air Force in the above potential is evidenced by the fact that the Stanford Report, the result of a study made by Stanford University for the Air Force to determine the desirability of civilian schools conducting primary-basic flying training of Air Force cadets, is now under consideration in the Pentagon. Since the Stanford Report is classified and its contents undisclosed, it is evident that the Air Force leaders are as yet undecided as to what to do with it.

"We may go into contract flight training on a test program with one contractor in the near future, to see if our data on conditions and assumptions made in the Stanford Report are correct," states Maj. Gen. Kenneth P. McNaugton, director of training, USAF.

Lower Cost

One point in favor of civilian schools training Air Force pilots through primary-basic, which it is believed the Stanford Report shows, is the fact that civilian operators can give cadets their training at a much lower cost than can the Air Force.

During the war, the civilian training bases produced a considerable saving over the military bases which were providing the same training. A large part of this was due to reduced personnel.

Dar Aero Tech, a basic civilian flight school at August, Ga., had a student capacity of 450, a total personnel paid by the contractor of 465 and 2 military officers. At Macon, Georgia a basic military flight school had 500 students and a total of 2350 base personnel.

The ratio of base personnel to cadets ran close to 1:1 in civilian schools while in military schools the ratio often approximated 4:1. A large number of these excess personnel result from the requirement that a military base must maintain a complete military organization, including a transportation corps, G-2, an adjutant general, etc.

Air Force officers admit that, if another national emergency should occur, they probably would put the primary-basic flight training of its cadets in the hands of the civilian flight schools so that every available regular and reserve military man could be at the front. The question then arises as to whether such a change-over can be made efficiently and in a short time if a nucleus of such civilian flight schools is not already in operation.

The answer of the Air Force to this is, "Yes." The country is in a far better aviation position now than it was in 1939 when civilian schools expanded and took on military flight training in a short 2½ months. We have many unused fields with empty barracks and we have available in civilian life about 190,000 commercial pilots.

The main problem in expansion is one of having the curriculum set up and having a standard trainer in production and capable of being manufactured in large numbers on short order.

Personnel Problem

The question of the Air Force is not one of whether a quick change-over to civilian training of cadets can be made in an emergency or one of economy, since contractors could produce a given number of pilots cheaper than can be done on military bases. The problem of the Air Force is a personnel problem of keeping in the military service an essential minimum number of personnel and providing them with occupations and essential training.

Officers state that now the Air Force has been cut to 48 Groups, there are not enough vacancies in the combat and tactical units to absorb all pilot graduates. Somewhere, these pilots must obtain flying experience until they have acquired the approximately 1000 hours considered desirable before assigning them to complex modern aircraft. Training of pilots, they say, involves not only producing a given number of pilots but developing the by-products of military organization, discipline, maintenance training, etc. The Training Command provides this facility.

Air Force strength figures recently quoted by the Air Force Times allow for training approximately 2500 flying cadets in 1950. On the basis of three cadets per instructor, allowing for a wash-out rate of two in four and two primary-basic flight classes per year, the Training Command can absorb as primary instructors about 800 pilot graduates.

The primary-basic flight schools take the cadets through their first 150 flight hours, until they graduate to advance fighter and multi-engine trainers. In the first 30 hours of this training, most of the unpromising pilot material is eliminated and it is here that the cadet establishes his flying habits and forms his attitude towards flying which will largely determine his future safety in the air. Instruction in this phase requires patience, human understanding and a cautious and reasonable approach to flying. It is problematical whether graduate pilots fresh from advanced flight schools where they have just completed training on F-51, B-25, jet fighters and other combat type aircraft can fit into the role of instructor and give the cadets the initial sound grounding and conservative approach to flying which is desirable.

Graduation of 19 Royal Pakistan Air Force cadets from Hawthorne Flying Service school in Jacksonville, Fla., last month has highpointed the potential for cadet training which exists in civilian flying schools. This is the first contract military flight training carried out by a civilian flight school since the end of the war, and the first time a civilian flight school has trained cadets from primary through fighter aircraft.

The training was done in PT-17, T-6 and F-51 aircraft without a fatality and the cadets received training in Link, instrument flight, night flight, low level cross country flying formation flying, camera gunnery and high altitude flying using oxygen equipment. Daily utilization of fighter aircraft occasionally ran as high as 7:15, with a normal average of approximately 4:20. A total of 1300 hours was put in on fighter aircraft.

While the Stanford Report is concerned with the feasibility of turning cadet primary-basic flight training (the first 150 hours of 300 hours) over to civilian schools, the civilian know-how exists to train flying cadets up to where the guns start shooting.

New Primary Flight Course Approved For 35 Schools

The Civil Aeronautics Administration has just appointed 35 flying schools to carry out an experimental flight training program using four-place planes in cross-country flying. The idea is to sell flying by demonstrating its use. The program, which operates under Special Air Regulation 336, will be in effect until October 1950, at which time CAA will evaluate the results with a view to making it a permanent training provision.

This is the observer-training plan which was spearheaded by C. E. A. Brown, Director of Aviation for Ohio. The program will require 15 hours dual time, 10 hours solo and 30 hours of observer flight time (to take the place of ten hours of pilot time) to qualify for a private pilot license.

Travel will be combined with training to give students additional cross-country experience in advanced types of planes which can be economically equipped with radio and instrument flying aids and to accustom students to landing at strange airfields.

By watching other students at the controls, flying under observation and sharing group discussion of flight planning, the student can learn cross-country flying and gain experience.

Advanced Experience

Over-all cost of the course will be about the same as the usual dual and solo flight course, but the student gets experience in advanced type planes which would be too expensive for him on an other than share-the-cost basis.

Concerning the course, CAA says, "We recommend that at least 20 different landing areas be included and the curriculum call for at least 40 landings away from the home base by each group of trainees. We urge that each operator fully consider the advantages of using airplanes equipped with two-way radio during this training. All training activity is to be conducted during daylight hours under VFR conditions. All models of the airplanes used must be soloed by each individual trainee during the course. At least 5 hours of the solo flight time must be in solo cross-country flight with landings on at least five airports, one of which is at least 150 airline miles from the home base. No ground school curriculum will be required."

Operators have a saleable idea in the observer-training plan which lends itself to advertising directed at groups and to stimulating public interest in the family-type plane as a means to travel.

Program Schools

Schools which have been selected to carry out the program in the test period are:

A.M. Vet Flight School, E. Los Angeles, Calif.
Aviation Industries, Inc., Coeur d'Alene, Idaho
Bellflower Airport, Inc., Bellflower, Calif.
Brayton Flying Service, St. Louis, Mo.
Central Airways, Des Moines, Iowa
Clearwater Flying Co., Clearwater, Fla.
Clinch Flying Service, N. Platte, Neb.
Coffin Flying Service, E. Los Angeles, Calif.
Danbury School of Aeronautics, Danbury, Conn.
Decker Flying Service, Bunellen, N. J.
Dixie Air Associates, Inc., Memphis, Tenn.
Haskell Flying Service, Long Beach, Calif.
Hayward Skyways, Inc., Hayward, Calif.
Lebanon Valley Air Service, Palmyra, Pa.
Louisiana Flyers, Inc., Lake Charles, La.
Mamer-Shreck Air Transport, Spokane, Wash.
Martin School of Aviation, Santa Ana, Calif.
Memphis Aero Corp., Memphis, Tenn.
N. E. Airways, Inc., Virginia, Minn.
Parks Air College, E. St. Louis, Mo.
Portsmouth Flying Service, Portsmouth, N. H.
Ragsdale Flying Service, Austin, Tex.
Rausch Flying School and Service, Inc., Teterboro, N. J.
Roscoe Turner Aeronautical Corp., Indianapolis, Ind.
Safair Flying Service, Teterboro, N. J.
Salem Air Service, Inc., Salem, Ore.
Scott Aero Service, Inc., Long Beach, Calif.
Stevens College, Columbia, Mo.
Swiftair Inc., Las Vegas, Nev.
U. S. Flying Services, St. Petersburg, Fla.
Volusia Aviation Service, Inc., Daytona Beach, Fla.
Western Skyways Service, Troutdale, Ore.
Witters Flying Service, Renton, Wash.
Wright Aircraft Co., W. Palm Beach, Fla.
Zigler Flying Service, Jennings, Ind.

Impeach VA for GI Flight Double-Cross—Sen. Thomas

Sen. Elmer Thomas of Oklahoma last week told AMERICAN AVIATION that the Administrator of Veterans Affairs should be made to carry out the intent of Congress in the administration of flight training benefits for veterans or face impeachment.

Back in Washington from a recent visit to his home state, Sen. Thomas is thoroughly irked over reports from fixed base operators and flight school owners concerning VA's continued violation of the spirit and the letter of the G.I. Bill of Rights which offers the veteran certain educational benefits in return for his war service. The Senator means to do something about it during the present session of Congress.

"I have asked the flight schools in my

Aviation Sales and Service

Fixed-Base Census: CAA is now in the process of preparing the questions to be asked in its coming census of fixed base operators. The census will be a composite of questions from CAA's Office of Aviation Development, Office of Program Planning and Evaluation, and Aviation Development Branch. Purpose of the survey is to tie down the locations and types of operations of fixed base operators and to discover what help they may need from CAA.

Price Cutting: *The mail brings some outspoken comments about aircraft selling by dealers who cut prices on new airplanes. Paul E. Rodreick, sales manager for Iowa Flight Service at Eno Airport, Fort Dodge, Ia., says selling airplanes below the list price lowers the value of the product and makes the dealer an order taker, not a salesman. "The average small operator isn't going to see more than from three to six medium-price airplanes in 12 months," he says. "Sometimes that operator feels that if he cuts his commission in half he will sell double the amount of planes, thereby making the same profit, but can you point to one case where this is true?"*

It never works out, Rodreick says. "Airplane sales will double when operators become salesmen and are willing to cooperate . . . Sales are not made any easier by cutting prices. All it actually does is to cut the dealers' profit and confuse customers. When an operator starts cutting, the prospect never knows when he will stop so he waits for the low dollar. If you have a good prospect . . . stay with the price, keep showing more need and value to him of the actual merits of the airplane."

"Aviation may need better and faster airplanes, more landing fields, larger discounts, but what is needed NOW more than anything else is operators that are less greedy and willing to spend a little bit longer on a sale. Aviation needs more selling and more salesmen."

Makes good sense. How about this price cutting? Can it be avoided? Let's hear some more on the subject.

—B. J. W.

state to send me specific data on the applications for flight training that have been disapproved by VA so that I may present this information before my subcommittee when the 1951 VA appropriation bill is considered," Sen. Thomas stated. "If the facts are as reported, I expect to sponsor new language in the bill which will make it impossible for VA officials to continue evading the will of Congress."

Sen. Thomas led the fight in the last session of Congress to remove the obstacles then being placed in the way of the veteran seeking flight training. He felt that the new language in the 1950 appropriation act was so clear that there would be no question as to Congressional intent.

"This language," Sen. Thomas stated "provided that if a veteran submitted an affidavit in which he declared that flight training would be useful to him in earning a livelihood, supported by two corroborating affidavits from disinterested persons, this would be prima facie evidence of the veteran's intent and entitle him to the training desired. But the Veterans Administration will not approve applications submitted in that manner, I have been advised."

The legislator feels that the VA is deliberately interpreting the law so that ex-servicemen cannot get the benefits which Congress intended they should have. He feels there is a studied attempt on the part of VA to put private schools out of business.

Schools Cleared

Sen. Thomas said that he understood VA's broad opposition to private schools was based on the contention that some of the owners had induced veterans to take flight training course and that some of the enrollees did not benefit from the program from a vocational viewpoint.

A survey ordered by the Senate Labor and Public Welfare Committee on abuses under the educational program is said to clear flight schools of these practices in recent years. This report has not yet been made public but VA representatives said they had been told that flight schools generally are in the clear.

Sen. Thomas expects to work with private school leaders in drafting new legislation after he is in possession of data on current VA practices. He said he had no figures on the ratio of rejections to the number of applications filed in his state. He pointed out that it was not a state situation but rather national in scope and that he would therefore treat it on a national basis.

If VA refuses to carry out the will of Congress after further clarifying legislation is adopted, then Sen. Thomas favors impeachment proceedings.

"Of course impeachment proceedings can be started only in the House but I believe they will be in order," he stated.

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FOR SALE—Steel hangar buildings, size 148' x 162', new and packaged for shipment with lights and erection tools. Also one hangar size 194' x 200'. Priced for quick sale. Send for photos and specifications. We will erect anywhere. Anderson Aircraft, 1700 Sawtelle Blvd., Arizona 3-2681, Los Angeles, Calif.

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Have you for sale a currently-licensed and good-conditioned AT-6? Buyers interested in one or more! Send all information: aircraft record, no. of hrs., final asking price and where located. Reply immediately to Box No. 683, American Aviation, 1025 Vermont Ave., N. W., Washington 5, D. C.

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WINGS OF YESTERDAY

25 Years Ago

The Collier Trophy for 1924 was awarded to the U. S. Army Air Service for having accomplished the first aerial flight around the world.

•

A new type of metal airplane, the Loening Amphibian, made its first public appearance on Jan. 18, 1925 at Bolling Field, Washington, D. C.

•

President Coolidge signed on February 2, 1925, the Kelly Bill authorizing the Postmaster General to contract for the transportation of air mail by private aircraft operators over designated routes. The bill provided a minimum postage rate of 10c per ounce on all first class mail and stipulated that four-fifths of the postage be paid to the aircraft operator for the mail carried.

10 Years Ago

(In American Aviation)

Major James H. Doolittle, aviation director of the Shell Oil companies in the U. S., was elected president of the Institute of the Aeronautical Sciences for 1940.

•

Plans for installation of instrument landing systems at approximately 10 important U. S. airports were announced by the CAA. Selection of sites was to be made from a list of 25 submitted by the Radio Technical Commission for Aeronautics.

•

Engineering representatives of eastern aircraft manufacturers met to discuss the problem of standardizing aircraft parts and dies to reduce unit costs and simplify procurement.

LETTERS

Military Plane Budget

To the Editor:

I have just finished reading the excellent front page editorial in the new (Jan. 15) issue of *American Aviation*. This seems to me to be constructive indeed and drives home the various points that need to be made.

Needless to say, we in the industry are encouraged to see this material given such a prominent display.

D. C. RAMSEY
President
Aircraft Industries Association
Washington, D. C.

Old Stuff for CMA

To the Editor:

We were interested to read your description of the "Sic-Sac" in your column "Extra Section" in the November 1 issue of *American Aviation* magazine. We were particularly interested because it was described as "something new under the sun." We believe that you will be interested to know that Compania Mexicana de Aviacion, our Mexican affiliate, has been using a bag apparently similar to the "Sic-Sac" for several years.

Our bag is not packaged and does not carry instructions but serves the same purpose. In addition to its other advantages the sack provides a larger target and more cover for the affected passenger. We just thought you would like to know that the equivalent of the "Sic-Sac" is not new under the Mexican sun.

KENNEY J. FROMM
District Sales Representative
Pan American World Airways System
Laredo, Tex.

Runway Light Control

To the Editor:

Just a note to let you know that I have received many inquiries regarding the article in the January 1, 1950 issue of *American Aviation* entitled "How Brightness Control of Runway Lights Can Save Money."

Most of the inquiries concerned the formula used to arrive at the rated life at the various intensities.

I was pleased with the amount of response I received and hasten to say that I am not a lighting specialist. I merely applied a formula worked out by lighting experts and available upon request, which I secured from the Westinghouse representative in Cincinnati.

Using the formula to denote dollars and cents saved was merely a matter of multiplication. It has been in effect here since approximately June 1949, and our bulb cost for high intensity runways has amounted to $21.60 in replacements.

I think this is proof that economies can be derived by using the degree of intensity necessary for safe operations and not using a higher intensity, as the difference between the intensity needed and the intensity used is added expense and cannot be justified. By the same token the other extreme of using one intensity lower than the intensity needed in order to save bulb cost cannot be justified.

It is very important that savings be acquired only as long as it does not affect the safety of the operation. Any attempt to effect economies below a normal safe operation would be foolhardy.

ROBERT M. ISENBERG
Airport Manager
Greater Cincinnati Airport

Rental Pool

To the Editor:

We want to express our appreciation for the article on the rental pool (Jan. 1, p. 47). It has brought in several inquiries by telephone one of which may result in 100 hours of twin-Beech time.

The article was well done and clearly presented. We hope it will arouse some interest in our "Aircab" idea from the airlines. After all there is no logical reason why it wouldn't work at all terminal points.

GUY MILLER
President
Winga, Inc.
Philadelphia, Pa.

BOOKS

THE AIRCRAFT YEAR BOOK FOR 1949. Edited and Published by Lincoln Press, Inc., Warner Bldg., Washington 4, D. C. 464 pp. $6.00.

The 31st edition of this official publication of the Aircraft Industries Association shows a marked improvement over previous editions. Under the new editorship of Fred Hamlin, William G. Key, Arthur Clawson and Eleanor Thayer, the annual's usefulness as a reference book has been substantially increased.

The traditional annual review of the government, manufacturers, airlines and other phases of aviation is well done. But there is much more up-to-date information available about planes and engines in production than in earlier editions.

New features include a 1949 day-by-day chronology of aviation events, a chronology of U. S. aviation, biographical briefs of prominent people in aviation, a chapter on planes that made U. S. aviation history (a very valuable reference addition), a directory section, and a list of aviation books published in the U. S. during 1949. There are other features to be commended also.

Through the years this annual has had its ups and downs and in recent years tended to become stodgy and dull. It is a pleasure to report that the 1949 edition reverses the trend.

ENGINEERS' DICTIONARY—SPANISH-ENGLISH and ENGLISH-SPANISH, a second edition by Louis A. Robb. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 664 pages. $12.50.

This second edition of Robb's Engineers' Dictionary has over 200 more pages than the original volume and covers a broader field including: greater attention to electrical and mechanical engineering; introduction of the radio and television engineering vocabulary; bringing all branches of Civil engineering up to date with special attention to airport construction photogrammetry, and soil mechanics; and incorporation of terms peculiar to mining, shipbuilding, logging, sugar milling, and oil-field operations.

FLIGHT INSTRUCTOR ORAL EXAMINATION, by Charles A. Zweng and Allen C. Zweng. Published by Pan American Navigation Service, 12021 Ventura Blvd., North Hollywood, Calif. 51 pages, indexed and illustrated. $1.

A question and answer review of the material used in CAA's flight instructor's oral examination. Covers CAR, aircraft, theory of flight and flight maneuvers, and principles of instructions. Recommended for both flight instructors and students.

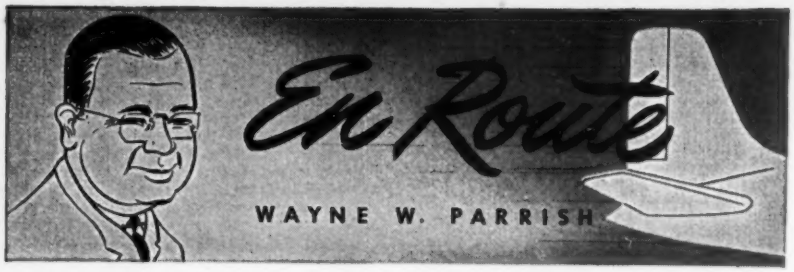
PRINCIPLES OF AERODYNAMICS, by James H. Dwinnell. Published by McGraw-Hill Book Co., 330 West 42nd Street, New York 18, N. Y. 380 pages, illustrated. $5.50.

An interesting treatment of important theoretical and practical aspects of aerodynamics which covers aerodynamic principles and verifies the findings by supporting test data. The outgrowth of six years' development of a set of printed lecture notes, *Principles of Aerodynamics* offers current discussions on Reynolds number effects on various bodies; subsonic, transonic and supersonic characteristics of aerodynamic bodies, theory of airfoil bodies, etc. Typical of the chapters included are those on fluid dynamics, airfoil characteristics, aspect ratio and plan form influences, viscosity phenomena, compressibility phenomena, the optimum airfoil, auxiliary lift devices, parasite-drag and power considerations, stability and control, engines, propellers and airplane performance.

OBITUARY

General H. H. Arnold

General of the Air Force Henry Harley "Hap" Arnold, war-time commander of the Army Air Forces, died January 15 of a coronary occlusion at his ranch in Sonoma, Calif. He was 63. General Arnold had been in retirement since June 30, 1946, when he left the (then) Army Air Forces after 39 years service. He was buried in Arlington National Cemetery.



Day-Dreams. Have you ever sat at your desk and day-dreamed about being far away at an oasis in the desert or in the midst of the **African jungle** or sitting on the terrace of a tropical hotel drinking tea or sipping a cold drink? Sure you have, one time or another, but just how were you dressed in those day-dreams? Were you wearing the business suit you had on at the time or were you outfitted for the occasion with sun helmet, tropical shorts and all the rest of the paraphernalia one usually associates with faraway travels?

How many times I've chuckled and even laughed out loud as I found myself in strange situations wearing the same business suit that I wear to my office, the same shoes, shirt, tie and the same old hat. Trying to flush a lion while driving over the African veldt in a jeep or sipping that cold drink in a desert oasis or plowing through the sand along the Nile or finding myself surrounded by hundreds of black natives at an out-of-the-way turf airfield in the heart of blackest Africa. Swift transition from a desk to a strange and fascinating different world and then another swift transition back to that desk wearing the same clothes.

It's like losing oneself in a moving picture for an hour or so—except that *this* is real. Those giraffes I'm driving up to watch a few feet away are not in a zoo, they're in their real home. Those thousands of big ugly hippopotami angrily spouting water as our flying boat disturbs them a few feet overhead aren't on movie film or penned up, they're the real McCoy.

Here is perhaps the most intriguing of all of the great possibilities of the airplane. Day-dreams can come true without making any greater concession to clothing than you make when you walk into a movie theater.

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Up the Nile. So gather around the check-in counter, friends, and join me on a visit to an airline with a siesta, hunt out some wild life in a jeep, and see a lot of odd and interesting things. And about this airline with a siesta, s' help me it's true. The airline just closed down early in the afternoon while crew and passengers took their naps. Everybody slept until a barefooted native shuffled into the room with tea and cakes. After that it was time for a drink, then came dinner, followed by a full night's sleep, and next morning crew and passengers got around to resuming their flight.

But maybe I'd better start this story at **Cairo** in the fall of 1946 when I had a week or so to spare and thought it would be a good idea to ramble on down to **Capetown** and take a quick look at Africa. After flying six days to get to Capetown I discovered Africa is a pretty gosh-awful big place. I also discovered that the guy who first thought up the expression "darkest Africa" must mean a country like **Nyasaland** which has three or four million blacks and about 3,000 whites.

The first stage of the trip was the 2,348-mile hop to **Nairobi**, capital of Britain's Kenya Colony, just about half way down the continent from Cairo. In a British Overseas Airways' Lockheed Lodestar, this was a two-day journey with an overnight stop at **Khartoum**. The distance was equal to a flight across the U. S. but the only spot in between Cairo and Nairobi that might pass for civilization was Khartoum.

The Lodestar was appropriately named "Lake Tanganyika" and the captain was N. A. Merwyn Smith, an R.A.F. pilot who knew the African country well and who wore khaki tropical shorts and shirt.

First stop south of Cairo was **Luxor**, a favorite tourist spot because of the great amount of Egyptian antiquities in that area. A few hours further up the Nile with nothing but sand in all directions, was one of the most God-forsaken spots I've ever seen. It was called **Wadi Halfa**, principally an airfield and a small building serving as dusty waiting room, office and snack bar, stuck out in the desert in that deadly heat. Just a refueling spot and gosh-awful place.

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Grand Hotel. By mid-afternoon we reached Khartoum and went immediately to the Grand Hotel, the mecca of all air travelers and a cosmopolitan cross-roads. No such things as private baths, and usually you share a room with one or more passengers, but the Grand Hotel isn't a bad place and has all the atmosphere you'd expect to find in a hot desert colonial town.

In all the 1,083 miles between Cairo and Khartoum there isn't a thing but sand, gravel and the lonesome winding Nile. Khartoum is at the junction of the White and Blue Nile rivers and is the capital of the Anglo-Egyptian Sudan, home of those tall strapping black Sudanese. Many ferry pilots stopped there early in the war when Khartoum was on the military air route while the Germans held North Africa. It is a hot town with few paved streets but lots of shade trees and a scattering of fairly nice homes for resident British military and civil officials.

In front of the hotel and facing the White Nile, which is anything but white, is a spacious terrace about which the social life of Khartoum seems to revolve. Tea in the late afternoon, cool drinks before and after dinner, a mixed crowd of transients going to and from South Africa and Europe, local officials, commercial travelers, and just about every nationality. The food is British, not bad and not too wonderful. I've stayed at the Grand three times now and each time I think I'll do some exploring of the surrounding area. But the heat is too depressing and I ended up doing what everybody else does—just sit and doze.

I was deeply impressed on this first two days of the trip with the way BOAC handles its passengers. At no time was any passenger in any doubt as to what to do and when to do it. On the plane the captain explained each segment of the flight in advance. On arrival at Khartoum the hotel and eating instructions were made clear.

In the lobby of the Grand Hotel was a blackboard giving all advance instructions about departure, etc. Questions about money exchange, etc., were all answered in advance. Nothing was taken for granted. And because BOAC seemed to anticipate all possible questions and to eliminate confusion in the minds of the inexperienced traveler, I have always given BOAC top billing as No. 1 in passenger relations. Even on the Lodestar everything was simple. Box luncheons, spares for those who happened to be extra hungry, were in the racks and you ate when you wanted to. For beverages you helped yourself. It all made good sense to me.

Next day we were off for Nairobi, some 1,300 miles south and a little east. First stop was **Malakal** with desert almost all the way. The first grass began to appear, that tall African grass that covers vast areas of the continent. During refueling we were taken in cars to a rest house for tea. Playing around on the floor was a baby leopard destined for the Dublin zoo as an R. A. F. gift.

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Bamboo Terminal. After leaving Malakal for the next stop, **Juba**, we entered the wild life region, chiefly tall grass but more and more bushes and some trees. Although the Lodestar wasn't flying too high, it was still too high for spotting big game, although I did see quite a few giraffe. When we reached Juba I knew I was a long way from my desk in Washington. The landing field was turf and the "terminal" was a thatched bamboo hut open to the four winds. On a big box which served as the "office" was some lemon squash for refreshment and hanging around the hut were quite a few black natives, some of them with fancy designs pricked in their face skins. Fueling, was by hand pump. It was hot.

And now came the last hop to Nairobi in the heart of the big game country. We left the Nile and the grassland at Juba and headed southeast over hills and a mountain ridge and crossed over several dense jungle areas. Several hours out of Nairobi appeared large and well cultivated farms, the first signs of European civilization. At one point I had a real thrill when the pilot flew low over a big lake and stirred into flight tens of thousands of pink flamingos. This huge fluid mass of pink against a green background was one of the most extraordinary sights I've ever seen.

If you've wondered what became of the airline with a siesta, referred to earlier, you'll have to read next issue. I just plumb ran out of space here.

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